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# THE GENERAL PROBLEMS OF PSYCHOLOGY

## CONCEPTIONS

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By

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*in*
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# THE GENERAL PROBLEMS OF PSYCHOLOGY

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## CHAPTER I

## INTRODUCTION: THE GENERAL PROBLEMS OF SCIENCE

A DISCUSSION of the general problems of any science consists in a reflective analysis of its system of theoretical aims and of the methods or procedure it employs. The field of these logical alternatives is not developed through a review of the empirical facts established by inductive research, but through critical examination of the nature and function of those concepts which the science has formulated and applied in the course of its work. It is the attempt of any mind to think out for itself the implications of its procedure within the given field.

The materials for such a discussion are to be found in the reflective consciousness of the thinker himself. To follow it, he needs only to be acquainted with the general field and methods of the science in question, since he will be concerned neither with the verification of results in technical experimentation nor with an estimation of individual contributions to scientific knowledge. In considering the general problems of any science, such comparative study is logically subordinate. The inquiry being an examination into theory, an historical survey could only serve the purpose of supplementing materials drawn primarily from the individual's own reflection. Any failure to make a systematic review of the field will be thrown into relief by a consideration of the actual variety of conceptions formulated in the course of historical development, and the thinker may thus be stimulated to verify or correct his own conclusions. But the products of this comparative study should have no independent presentation in the development of his work.

Logical and historical inquiries, though mutually assistive, have independent aims. In historical studies the results of reflective criticism should appear in the clarity or integrity which they contribute to the work itself, but not as formal arguments interpolated in the narrative. So also should one's study of the variety of human opinion concerning a subject of critical inquiry appear only in the penetration and adequacy of scope which it contributes to the discussion.

A general critical inquiry is thus an introduction not to the literature of the subject but to its theory only. Specific points of view have place within it in so far as they represent logical alternatives in reflection, but not as the contribution of individual thinkers to the history of the subject. Such a discussion is impersonal and timeless in its standpoint. It considers only the function and validity of concepts, not the occasions when they arose or the individuals who may have formulated them.

In the methodological procedure of every science, this critical reflection must, at some point, be undertaken. No study, however specialized, can be so limited or defined as to avoid the implication of those general conceptions and regulative canons which guide science at large as well as determine method within its own particular field. In presenting the results of such inquiries, however, the discussion of these general problems properly finds no place. The critical aspect of their treatment is limited to the elaboration of technical methods and the concrete processes of experimentation, except where some individual point may unavoidably be raised by the nature of the problem.

But in general, also, these questions are largely ignored. The group of problems under investigation by any science, as well as the sum of its empirical results, so obviously lies within its recognized field that questions of delimitation or methodology are not raised. Attention is confined to a definition of the problem and an indication of its bearing and significance, to the explanation and defence of special technical methods employed in its solution, and to the presentation and interpretation of results experimentally established.

Nevertheless through the whole literature of investigation and across the field of all special discussion runs the trail of these general considerations. In the formulation of problems and interpretation of results alike, a system of methodological and critical postulates is at least provisionally assumed. As latent guiding conceptions, they enter into all scientific writing and affect the scope and form of every piece of work, as the postulation of conservation underlies all measurement of dynamic transformations and the ascription of ideal valuation is involved in every appeal to taste.

On the other hand, these general questions of science do not constitute an independent group of problems, nor is the result of their discussion embodied in a separate system either of facts or of principles. They accompany and modify all concrete work in which they find their logical representation, as abstract or formal principles in general appear solely in the determination of empirical materials. It is the existence of these dual aspects which gives to every science its two characteristic groups of problems.

Each natural science, in the first place, deals with a set of special problems, the solution of which affords the data for that systematic body of knowledge for which its name stands. Mathematics must prove the three angles of a triangle equal to two right angles, and show that the sum of any two of its sides is greater than the third. It must devise a method of determining the area of a circle and the cubic contents of a sphere. It must seek the general form of a prime number or the summation of an ordinal series of quantities. In short, it must systematically interpret to us the relations of numerical and spatial magnitudes.

Biology must explain the constitution of the living body in terms of its component cells, and show how the differentiation of these units determines the variety of organic tissues. It must trace the successive generations of cell-units as they arise, and penetrate the processes of nuclear division in mitosis. It must describe the common life of the organism and the relation of parts and activities therein. It must not only follow the course of development in the living body as a whole, indicating the connection of each stage in the process with those which preceded, but also study the ecological relations and reactions of the organism to the objects about it.

The mental sciences must analyze the structure of mind, exhibiting its typical habits and predispositions, the nature of the field of consciousness and its constituent elements, the mental and physical conditions under which its activities appear and the characteristic changes which they undergo. It must trace the succession of phases which the mind presents in the course of its development and the laws according to which they occur. It must explore the influence of mind upon mind in human association, and both elaborate the concepts of a social psychology and lay the foundations of educational practice. It must study the norms of the mind as they find expression in characteristic reactions and trace the process of evolution which has given to these ideal concepts their present form.

Further, within these generic groups, each special science has its own highly defined and technical problems. Those of geometry, arithmetic, algebra, and trigonometry fall alike within the general field of mathematics, but each undertakes a characteristic series of researches involving specific assumptions and a unique method. The subject-matter and system of concepts of any such special branch of study are shared by no other science. So also with botany and zoölogy in the general field of life-phenomena, with morphology and physiology in relation to the problem of organic structures and their functions, with the objective reactions studied by ecology and the perversions of form or activity with which pathology is concerned.

Similarly within the field of mental science, descriptive psychology is engaged in working out the systematic form of the mental functions, and psycho-genetics in tracing the origins from which these habitual activities have arisen or the laws according to which their historical modifications have taken place. Social psychology considers the reactions of mind on mind and studies the forms in which they coöperate or mutually modify one another. The social sciences, finally, are employed in exploring both the conditions under which these minds associate in the manifold forms of human activity and the character of their several institutions and products. One group of sciences thus deals with number and quantity, another with life and vital processes, a third with mind and its laws, the general field of science falling into separate provinces according to the class of facts to be studied.

Within its special field, each science has the same function to perform. It must explore a particular class of phenomena, and give a systematic description of the observed facts under general concepts of likeness and difference, analogy and homology, type and variation, and the like. It must also ascertain the relations which obtain among these facts, determining correlations, concomitant variations, causes, effects, and formulate the conditions under which the recurrence of any given phenomenon may be expected. Finally, it must seek to articulate the series of events in which the system of facts has its explanation, that is, to trace the history or development of each group of phenomena. The special functions of any science thus fall into certain large classes of procedure which mark all such investigations in common. Nevertheless, within these general forms, the content of each particular science is specific and unique.

In addition to a group of special problems determined by its subject-matter, each science presents a further set of questions for consideration at some point in the course of its treatment. These matters do not directly touch the content of the science or the mode in which its data are to be classified and explained. They are involved alike in all special investigations which the science may undertake; they modify the whole systematic formulation of its results; and they affect the interpretation which is put upon its work in relation to the field of human experience and values at large.

These questions are of general rather than particular import, since the whole approach of the thinker to his problems, as well as any evaluation of his results, will be affected by the manner in which he conceives them. They are problems concerning the modification of more general concepts which the handling of his subject-matter involves, problems of viewpoint and the use of logical formulae. They are problems also of historical and functional associations, of the contribution of his science to the general sum of human knowledge or human good, and of the utilization of its results in that last critical reflection upon the presuppositions and meaning of experience which philosophy undertakes.

Such are the general problems of any science as contrasted with those which depend upon its special content. They belong to three groups according as they are questions of conception and method, of division and classification, or of relation and significance. In each science, this group of general problems arises. They are subjects not for investigation but for reflection and criticism. The discussion of their bearing and significance does not commonly find its way into textbooks, except in the form of certain definitions and general propositions which are stated in the introduction. Together with historical reviews, they form the staple of presidential addresses, and, in one aspect or another, are elaborated at scientific meetings in papers by logic-obsessed minds. The actual field-work of science goes on without troubling about methodological problems; and, in the output of special results, they may not even be mentioned.

Yet through all such work runs the thread of these perplexing questions. Not the most specialized observation is independent of them. Every investigation, however minute, every relation, however highly defined, assumes their solution in one form or another. They do not come under review because they are presuppositions of the scientist's activity, not the objects of his study. Classification and method are the glass through which the experimentalist views his work, defects wherein may distort his whole vision. The value of an inductive research is imperilled as much by a mistaken conception of the point of view from which the problem is to be regarded as by insufficiency in the basis of its generalizations or laxity in their verification. Matters of fact and individual observation, after all, are easily established. Error in such cases may readily be detected, and its occurrence entails no very severe penalty. Delay is occasioned. The observation must be repeated, and the fact definitely determined. But there follows no such retardation as results from the misdirection of effort through an error in conceiving the purpose of scientific research, from the perversion of method in undertaking a study, or from the rise of false hypotheses in regard to fundamental explanatory concepts.

These misconceptions constitute the most profound errors which scientific criticism is called upon to review. The individual may be an acute observer or a patient scholar; but, if the guiding assumptions of his work be mistaken, the force of every gift he possesses further subverts the purpose of research and hinders progress. The work done under such conditions is not merely negative. It is an obstacle set in the way of knowledge, whose seriousness is proportionate to its bulk. From the very outset, therefore, the formulation of proper conceptions in this field is fundamental to scientific procedure. The growing body of knowledge in any of its branches both gathers momentum and takes definite direction as it accumulates. In the beginnings of discovery, the relations of things are perceived dimly and with difficulty. The meagreness of its basis makes generalization insecure and narrow. As knowledge grows, not only does the number of facts increase, but each item becomes more significant in the light of the whole system. A single discovery may then be sufficient to throw into relief the connection which binds together a great group of phenomena. With ever-increasing rapidity is progress thus made as the basis of organized knowledge extends.

Not only so, the development of knowledge is thereby rendered more secure as well as more rapid. The increasing system of generalizations already made determines with growing exactness the relations which exist between the subject-matter of any one science and the whole order to which it belongs, and thus gives progressive definition to the direction in which it is to advance. Misconceptions of scope, of methods, of modes of verification and the like, are successively dispelled and their recurrence thereafter rendered impossible.

In the early days of knowledge, such misconceptions abound. The mind's activity is not determined by a sufficient body of inductions to make its speculations rational. Fantastic hypotheses are shaped. Gross perversions of the meaning and scope of science arise. Metaphysical and theological concepts invade its territory. The thinker turns from the patient exploration of fact to spin deductions from a system of a priori definitions. Fact and myth are interwoven in a new unitary complex. The natural connections of cause and effect are supplemented by essences and forms, magic and miracle, as method shifts unpredictably between theological interpretation and explanation in terms of natural law. When the very field and nature of inquiry are thus clouded, the mind wanders perplexed in a wilderness where observation and speculation, knowledge and superstition, and even the conceptions of science and philosophy themselves are blent in inextricable confusion.

It is the general work of reflection, as over against the particular function of any special science, to disentangle this confusion of points of view and problems. It must formulate and systematize the conceptions under which it works; for in terms of these regulative canons the object of science is defined, and its methods are determined. It must clearly apprehend that a set of specific assumptions is involved in its undertaking, while the criticism of these postulates is deliberately put aside as lying beyond its province. Were this not done, perpetual confusion would arise as to the legitimate task of science. The thinker would find himself confounding his work with metaphysics on the one hand or with practice on the other.

To recognize and conform to the limitations which its special object imposes, to formulate the basal concepts which guide its work, and to subject its technical method to critical review is the first general problem of any science. It is this process which clarifies its point of view and makes it aware both of its own existence, as a delimited province of knowledge, and of the relations which obtain between its own field and those of other sciences. It is this process which constitutes it a science, possessing a conscious aim and a distinctive method of procedure. It is this process, therefore, which gives unity to the activities of any science. For its observations and results, its special problems and the explanatory concepts to which their study leads, compose an organized system primarily in virtue of the common assumptions which run through them, the community which marks their ideal aims and their modes of approach to knowledge.

It is these preconceptions which give form to our organized empirical knowledge at large. As each special science possesses its own particular set of assumptions, so does the body of sciences as a whole rest upon a system of conceptions as to subject-matter and mode of treatment which determines both its scope and the place of its products in the general system of knowledge. Science has suffered many wounds, from misguided friends as well as from adversaries, through looseness in this regard. Her work has been misconceived, her method distorted, her results decried because these presuppositions have not been formulated with sufficient precision. A grotesque exaggeration of her function in the one case is confronted with an equally absurd denial of value in the other.

In one age, or by a particular group, it has been assumed that science, in its progress, will displace philosophical criticism and appreciation; or that its discoveries will finally make individual genius dispensable, and its contribution to life render the inclusion of other elements of culture superfluous. By another group, or in another age, the scientist has been subjected to ridicule as a dreamer whose theory-spinning had no significance for the man of affairs; or his very field of investigation has been expropriated, and a purely metaphysical interpretation extended to its empirical data. The consistent pursuit of scientific work and the rational criticism of its accomplishment depend alike upon a clear conception of the limitations under which it is prosecuted.

The second general problem of science concerns the internal organization of its activities. At the time of its emergence as a distinct field of inquiry, each science may be called simple, in having a continuous territory without distinctions of level and in working out an elementary system of laws. In the course of development, however, the field grows increasingly complex as investigation is pursued and observations multiply. The progressive elaboration of natural law unites individual groups of facts into more and more closely knit systems which may be conceived as unities in a larger field of phenomena. Cleavages thus appear within the general subject-matter, and as a consequence of their growth subdivisions are formed within it, giving rise to a group of more limited and highly specialized sciences. This development requires the formulation of principles of definition and the delimitation of those subfields into which the general subject-matter of the science is now divided. It also calls for an organization of the whole group of related inquiries into a systematically ordered series.

To this end, it is necessary that one should have a clear conception of the scope of each subdivision in the related group of sciences. One must know the nature of the special problems with which it is occupied, and be able to define its limits in terms of the guiding principles which set it off from neighboring branches of study within the larger common field. In this adjustment of relations, an initial difficulty arises when a multiplicity of principles is assumed, such as results from any variation in the point of view during the course of its application. Inevitable confusion is occasioned by such a lack of unity in the assumptions under which classification is made.

A system of subdivisions must exhibit a single principle. If two subgroups are to be differentiated within any given field they will be mutually exclusive and coördinate only in case their separation embodies a single analytic conception. Otherwise the two—while each alike may represent some valid principle of division—will have no true classificatory relation to each other. Normal, genetic, experimental, and physiological psychology, for example, form such a series that each term has a proper use in indicating an important field of study, yet no one is exclusive of any other. Classification requires a clear conception of the principle which underlies the process of subdivision; and, in considering the various terms applied to different phases of the work done within a given field, it is the question of principle which must be looked to first of all.

The field of any modern science is not a single group of simply related facts, but an exceedingly complex system presenting innumerable gradations of character and a multitude of articulations more or less clearly apprehended. The incessant reinspection to which its phenomena are subjected, as technical methods are perfected or explanatory concepts modified, is necessarily accompanied by a parallel process of classification and restatement of relations which grows more complex at each step of advance. In every field, the range of facts to be explored has been enormously amplified through the application of new methods of analysis or the elaboration of the mechanics of investigation. From the descriptive treatment of facts, inquiry is extended, as knowledge grows, to the history of their changes, in order that the laws of their development may be established. But, in addition to the determination of character and history in the typical individual, the limits of variation must be ascertained and as many variant types defined as the distribution of individuals necessitates.

Finally, a study of functional relations must be added to morphological description, and the systematic reaction of individuals and groups must be determined in relation to impinging forces or habitat and stimuli.

With the development of inner complexity in the system of any science, a process of specialization takes place which affects both the problems attacked by any individual student and the methods which he characteristically employs. A natural and largely unreflective segregation of groups occurs as the objects of each become more sharply delimited; and, as an increasing body of literature is produced, the group becomes more explicitly conscious of its own existence and aims. A distinctive name for each such specialized branch of science is then adopted and formal organization commonly follows, not only in the sense that a certain class-consciousness arises on the part of all those directly engaged in its study, but also in that they seek regular opportunities of meeting for discussion and establish means for the publication of researches and general furtherance of their science.

In such cases, however, a variety of regulative principles commonly underlies the many specific subdivisions which are made. In one case the separation turns upon conceptions of aim, in another upon the class of data, in a third upon technical method, and so on. As information in each subdivision of the field is extended and organized, the designative term by which it is known carries the mind more and more directly to that increasing body of definite knowledge, while the regulative principles in which it is grounded are allowed to fall into the background. The result, as regards the casual student at least, is a certain confusion of mind as to the relations its bears to other studies falling in the same general group. It therefore becomes a matter of importance to formulate each such principle of division in isolation from the rest, and to see clearly the group of studies which results from its application. In this way must be discriminated structural and functional treatments, descriptive and historical methods, classificatory and explanatory points of view, and the like. Analytic and genetic, experimental and theoretical, normal and pathological studies constitute similar logical pairs, which in each case represent a single regulative principle and divide the field between them.

False restrictions and equally undesirable extensions in the conception of a given field or the application of a particular method may arise from the failure to grasp clearly the nature of the principle upon which any such subdivision rests, or to apprehend the implications which it carries as to range of problems, explanatory concepts, and the like. To limit the scope of genetic psychology, for example, to a study of the process of constructive change which marks the first half of individual life implies a confusion of this kind. A still grosser error is to confound it with child-study. Genetic psychology is the study of genesis within a particular class of phenomena. Its function is to trace the rise of mental states and reactions, attitudes and types, irrespective of their relation to such norms as underlie the conception of ideal evolution. A similar fallacy is involved in the tendency to separate and even oppose the work of experimentalist and theoriest in psychology, as if the field of experimentation differed from that of theory or were determined by a disparate aim. The systematist in psychology approaches an insufficiently considered but imperative task in attempting to define the field of each branch of his science as a preliminary to his general problem of organizing its results in a coherent doctrine.

A third group of general problems remains. Each science is a member of the whole system of sciences, of the whole system of knowledge, and of the whole system of life. These relations must be adjusted. To one science a debt is owed; to another a contribution is made; with a third no immediate relation is felt. The place of every law and every science in the general fabric of knowledge is determined by its organic relations. Each concept or system of concepts performs a specific function in the intellectual economy, as each vital process makes a unique contribution to the economy of the living body.

In both cases, also, the conception of function may be either restricted or extended. Elimination is a more general term than transpiration, secretion than salivation. Similarly, psychology is more general than psychiatry, psychogenesis than habituation, ideation than memory. Each of these more inclusive terms indicates a unity of functions within which the particular terms severally fall. Habituation is an essential constituent of psychogenesis, psychiatry of the system of psychology. The latter draws freely upon every specialized inquiry into the forms of mental reaction in its synthesis of the phenomena of mind. The whole system of mental sciences, including social as well as psychological studies, has an essential unity. It is indeed broken up into a score—or five score—groups of special students who are partially indifferent to, as well as ignorant of, one another's work. But all these men are still coöperating in a common task, to make known in all its manifold forms and relations the structure and activities of the living mind. The achievement of this aim rests upon nothing less than the sum of knowledge which all these special sciences together contribute.

Not only so, but the progress which is made in any one field has intimate relations with all new discovery in the science at large. Each is studying the same fundamental set of activities modified here by one, there by another, group of special conditions or stimuli. It is these varying circumstances which constitute the general means of exploring any field of science and determining the common principles of change occurring within it. The science of human physiology owes as much to the great comparative students, Harvey and Schwammerdam, Leuenhoek and Malpighi, as to those who confined their study to that single living type itself. Within the latter field, also, our knowledge of immunization and the physiological reactions by which the body is protected is due not so much to physiologists as to the pioneers of experimental medicine.

This contact of any science with other fields and problems extends throughout the range of reflection, and links material progress with the speculations of men who have been primarily interested in abstract and even metaphysical aspects of experience. Thus physics and astronomy owe much to the theoretical studies of such men as Descartes, Leibnitz, and Kant, while the conception of evolution took definite form as a philosophical dogma—in the work of Diderot and Bonnet, for example—before it was inductively established as a scientific generalization. In the study of mind, likewise, whatever the special work of any student, his mastery of problems is furthered not simply by researches in his own special field but by the whole system of investigations, analytic and developmental, specific and comparative, which is being prosecuted in the science at large.

The sense of unity in the field of science, however, must not be allowed to confuse the distinctions upon which specialization rests. Every reaction of the mind, in theoretical as well as practical affairs, is determined by a definite aim. An individual science can no more be merged in the general quest for truth than it can exist in isolation from it. The mechanics of qualitative synthesis may be of the first importance to chemical science, as an analysis of the reactions of substances in the living body is for physiology; but neither is the value of physiology thereby destroyed nor is chemistry supplanted by molecular physics in the system of sciences.

The progress of knowledge is marked as much by specialization in problems as by organization in the results of research. Selection and limitation are necessary to the attainment of definite truth. The differentiated studies of mental and social science are a necessary condition for the existence of an organized body of psychological knowledge. To insist upon these distinctions, therefore, is not to reduce psychology to a group of unrelated studies, but simply to secure a procedure fundamental to the determination of truth at large. The mental sciences must not be confused but made complementary by mutual elucidation and support; for, the more profound knowledge in any field becomes, the nearer it draws to all other science.

Especially must the function of descriptive science in general be clearly conceived. The relation of most of the natural sciences to philosophical speculation, for instance, has at one time or another been confused by distortion either in the method applied in prosecuting its study or in the conception of aim which determines it. Deduction from metaphysical principles has perverted its method at one point; at another, its scope or purpose has been misinterpreted, so that it has either been made to replace metaphysics in the system of knowledge, or exploited by a particular philosophical school as a contribution to its own propaganda. Psychology is a natural science, and the student must hold fast to a perception of its limitations as well as become cognizant of the range and complexity of its data. The search for theoretical principles must never be confused with the work of applying in practice such laws as have been established. At the same time, the scientist cannot afford to lose sight of their common ground and of the obligation under which science at large rests to clarify the significance of theoretical knowledge as the general basis of adaptation.

In regard to the arts of life and their conduct, likewise, the function and product of each individual branch of knowledge are to be considered. The conclusions of any science are specific, and each has its characteristic point of application in human affairs. One serves practice in this field, another in that; and the apprehension of these practical functions is to be sought consistently. In what way may its new truths be utilized, is the question—incessantly reiterated—which is asked of each science. The world seeks to know at what points the new principle is applicable, from what specific defects it relieves our procedure, and in what way the new method can be most conveniently and successfully applied. *What can it do?* is the challenge by which the representative of every special science is confronted. That it should present merely a consistent body of related truths is not sufficient. It must also be a system of principles and conclusions of practical utility.

With growing insistence, the demand is made that each science shall be applicable somewhere, somehow, in solving the problems of life, making it more favorable in its conditions or more desirable in quality. Thus mechanics contributes to engineering, in the designing of bridges, the building of ships, the construction of machines. Thus chemistry directs the processes of dye-making, the manufacture of drugs, the selection of foods, the making of explosives. Thus astronomy presides over navigation, and meteorology over weather predictions; physiology and pathology form the basis of medical practice; biology is at work upon the problems of breeding, whether of plants or animals, and psychology has been called into the service of therapeutics and education, of penology and social reform.

The working out of this system of relations is often a slow and laborious process, while the very possibility of utilization is sometimes long in doubt. New discoveries may carry little indication, in their own constitution as scientific laws, of the range of their practical availability. The inventor who applies a scientific principle to the solution of a new mechanical problem needs a mind as ingenious and synthetic in its action as that of the scientist himself, though the conceptions with which he works may belong to a separate order.

The service of any science within the system of arts presents a general problem in addition to the unlimited series of particular applications discerned by practical genius. The settlement of this problem depends upon clearness of conception in regard to two matters: first the nature and limitations of the science in question, and secondly the scope and character of the practical activity in connection with which it is being considered. With these two conceptions clarified, little confusion is likely to arise as to the possible applications of any science in furthering the art in question. Nevertheless, the fact that an interpretation of scientific results is called for, rather than an application in the strict sense of the term, may at any moment cloud the issue in a given case.

The full development of any science, or of any new discovery within its field, includes a perception of its specific contribution to the arts of life. Only a pedantic mind will overlook the unity of existence, and assert that an intellectual love of truth should be the student's sole ideal. The system of knowledge in which any science issues cannot be regarded simply as an object of aesthetic contemplation, existing in isolation from the world of experience at large. The study of each group of facts had its origin in some human need; and, however far the mind may have been led in its formulation of the purely logical relations of phenomena, this practical origin can never be ignored. The truths which science has established are part of a greater world of ideal values in which the human spirit finds the theatre of its action.

It is not in order to bend science to the utilitarian yoke that the demand for practical results is made. The requirement arises from that very sense for unity out of which the scientific activity itself springs. Theoretical truth has no claim to a place apart, a pure existence in the world of logical reflection. On the contrary, every element of truth must find its place in the general system of values and be made contributory to the sum of human good. Each science must ultimately have a relation to all others in the system of truth which they constitute, and each must possess a definite value in the system of practical ends which the human will is in process of realizing, or we must give up both theoretical and practical problems as insoluble.

The general questions to which each science must address itself have been stated thus: to define its point of view and formulate the system of conceptions upon which it proceeds; to develop a technical method and organize its field in terms of specific principles; and to make clear the value of its contribution to human knowledge and the arts of life. They may now be restated in a different way. Each science is called upon to consider both the system of conceptions with which it works and the relations in which it stands.

Its guiding conceptions fall into two groups, the one general, the other special. The general conceptions of any science are those regulative canons and modes of procedure which it shares with all natural sciences, whatever their subject matter. Such are the conceptualizing method which intelligence applies to experience in its theoretical and practical domains alike, the abstract form which all products of reflection take, and the experimental approach to knowledge in which empirical procedure is grounded whether it deal with nature or with mind. In addition to such communities of viewpoint or method, each science is to be distinguished both from other sciences and from those products of intelligence which root in an ideal valuation of experience, such as philosophy and the arts. In other words, its status in the general system of knowledge must be indicated and its relation to the general conduct of life made clear.

The special conceptions which each science must formulate comprise the definition of its subject matter, the development of technical method, the statement of its problems, and the systematic subdivision of its field for the purpose of organizing practical work.

A definition of the aim or scope of any science may involve much difficulty. New sciences arise by the continuous extension and modification of knowledge through a collaboration of many students, with their special interests and individual angles of vision. Each line of investigation has manifold branchings as well as a main stream. Its problems are in intimate contact with those of other sciences, to which it contributes or from which it draws support. The fields of such a group overlap at the edges, so that the study of a special problem in one of them may directly provoke speculation concerning others which lie beyond its boundaries. As a result of this contact, psychology, for example, owes much to physiology, experimental medicine, and biology.

In order that the work of any science shall have unity, it thus becomes necessary to define its technical aim and to point out the limits prescribed by it, so that when the student avails himself of the results of investigation in an adjacent field, or follows his own trail across their common boundary, he shall retain a clear notion of what he seeks and of the use which may legitimately be made of his data. This general question includes at least two other problems in addition to the definition of subject matter itself. One of these is abstract, namely the formulation of criteria for determining the distribution of such subject matter; the other is concrete, and consists in a general review of the data upon which the student may draw in his work.

The formulation of scientific procedure is in part general, as has already been pointed out; but it is also in large part special. The details of technical experimentation in any science are largely dependent upon the qualitative nature of the materials with which it deals. The general criteria of evidence are alike in all fields; but, to apply such rules successfully in any given case, one must be acquainted with the special plexus of relations in which it exists, and with the units of measurement which may legitimately be employed. One must sift rigorously the specific conditions under which each experimental test is conducted, in order to lay bare the characteristic errors by which it is beset and the corrections and simplifications they necessitate. Finally, one must consider the adaptability of special methods to particular classes of phenomena or lines of investigation, and make use of the differentiation in general modes of approach which characterizes the various branches of science.

The discussion of data and methods leads directly to a consideration of the next group of questions. It includes a discrimination of the various classes of problems which the science sets before itself and the orderly subdivision of its field into a series of special branches having organic relations and systematically covering the range of phenomena with which the science at large is concerned.

The second series of problems which must be considered at some point in the development of any science, falls likewise into two subgroups, one arising from the systematic subdivision of its general field and constituting the question of internal relationship, the other depending upon its existence as part of a general system of knowledge in a significant life and constituting the problem of external relationship. In short, that whole series of connections and values indicated in defining the conceptions of any science must also be taken up concretely and in detail.

The range of psychology is commensurate with the distribution of mind. To deal adequately with this complex material, its field must be subdivided according to the grouping of its special phenomena, or according to the aspects and relations of the mental life to be studied. In each province, emphasis will fall upon particular problems, and characteristic methods will attain prominence. The primary differentiation will be accompanied by secondary modifications in general viewpoint and values. One branch will have affiliation with the biological, another with the sociological sciences. In one group of studies, reference to the physical conditions of mind will be elicited. Another will arouse habitual interpretation in terms of educational applications. The practice of one form of investigation will induce a preoccupation with the technique of introspective analysis; that of another will create a constitutional interest in the functional significance of mental activity; and so on.

Hence it is not the mere subdivision of a general field which is in question, but a differentiation affecting problems, methods, and applications alike. In consequence, there is danger of a certain isolation and narrowness on the part of specialists, as a result of which the relations and importance of their own subject are misconstrued. It thus becomes important to discriminate the various branches of psychology and define their specific aims, to state their general problems and indicate the data upon which their solution depends, and to show the bearing of their work upon that of other branches and its value for the science as a whole.

A consideration of the external relations in which psychology stands will naturally begin with the question of its connection with those nearly related sciences upon which it draws in the prosecution of its own work, and of those to which it contributes either data or suggestions of method. If we begin with the most abstract sciences and the general conditions of mental activity, it may be said that psychology is indebted, first of all, to mathematics. Quantitative conceptions are applied in the statistical treatment of subjective reactions quite as much as in describing variations in their physical stimuli; and adequacy in the results of experimentation is measurable in terms of their approach to a quantitative form. But, even if this be so, the relation is still that purely general one which mathematics bears to all sciences which attempt an expression in exact terms, and it has, therefore, no material significance for psychology.

It may be said, in the next place, because the material world and its changes constitute the system of stimuli to which the mind responds, that the science of physics must be of direct importance to psychology in a sense not applicable to mathematics. Now it is obviously true that the correlation in question is a general one, and that we explain variations in the make-up of subjective experience by reference to the objective world as its condition. This connection may be said to afford the psychologist his point of reference and general measuring-rod, so that the appearance of distortions in this relation mark the beginnings of abnormal and hallucinatory experience. Between these terms, the psychologist habitually interposes the notion of the nervous system and its functions as the immediate basis of modifications in consciousness. Nevertheless, it is not these physiological reactions but the objective stimuli themselves with which the mental change is consciously associated in normal experience. It is also the latter series of relations with which the bulk of experimental work is concerned, the problems of physiological psychology constituting merely a particular group in the larger field.

But while physics, like mathematics, contributes important elements to special method—in the measurement of stimuli, for example, and the recording of reactions—the relation may still be called general rather than special. The mechanism of experimentation is in constant touch with the conceptions of physics, and it affords many material suggestions to the investigator, especially in the field of sense-qualities and relations; but its significance is, on the whole, neither material nor specific.

It is only when we reach the organism, and especially the nervous system, that this association becomes sufficiently characteristic to be considered in its specific connections. The practical relations of psychology are thus with the biological and physiological sciences on the one hand and with the human and social on the other. The former, when thus conceived, include questions of morphology and chemical constitution as well as of function and ecological relations. The latter, likewise, is concerned with the appreciation of life in history and ethics, not merely with its description in the sociological sciences.

Finally the contribution of psychology to the arts of life is to be considered, including all orders of plastic materials whether physical or mental, and every process into which mind enters as a constructive or directing agency. As knowledge forms the theoretical basis of practice at large, so psychological analysis affords the general approach to all those practical problems which involve the participation of mind, either as subject or modifying influence. Within the one series fall the problems of education, therapeutics, and penology, to which the methods of psychology have already been largely applied; but it includes also the whole field of mutual understanding and social adaptation. In the other series, comprising the plastic and literary arts as well as human institutions at large, psychology provides one of the fundamental constituents of treatment. The objective aspect of these social products was the first to receive attention—for example, in the study of educational materials and their logical arrangement in curricula—but this must be supplemented by an examination of the subjective or psychological element before the account can be accepted as adequate.

It is not in the more obviously representative and ideal constructions alone that this point of view must be applied, but throughout the range of plastic materials which have been shaped to any end by the selective and creative activity of the mind. It is, of course, in this way that we habitually construe fashion, custom and tradition, law and public opinion. But the principle also enters into any intelligible account of human implements and dwellings, food-products and clothing, means of transportation and manufacture—in short, of everything that has been modified or employed by man.

To describe the languages, arts, or creeds of any people, or to differentiate their social, political, and religious institutions, is to formulate a problem for the psychologist as well as to answer another in the field of sociology. The plastic materials of the physical world are moulded to forms of utility or beauty, and organized under conceptions which find their only possible explanation in the inventiveness of a mind which realizes its ideal aims through these objective syntheses. Whether psychology have accomplished little or much in any one of these fields, it is only through its aid that their problems can finally be solved. And it is its greatest—as it is its last and most difficult—task to undertake this analysis of the mechanism of life in all its practical and ideal activities.

## CHAPTER II

## THE GENERAL TASK OF INTELLIGENCE

SCIENCE and practical intelligence have a common root, however diverse or far separated their upper branches may seem, for a single aim pervades all the activities of reason. It is everywhere engaged in giving an orderly form to the content of experience. In ancient philosophy, this undertaking was symbolized in the myth of Demiourgos, chief of the lowest order of eons in the divine pleroma. These spirits were the nethermost outposts of intelligent being, in direct contact with the forces of Chaos, Reason's huge, blind antagonist. Into the world's unimaginable welter, the Demiurge descended, subdued his vast and formless foe, and transformed his territory into the visible universe.

In this fable of the spirit, the first assault of intelligence upon its problem is pictured. Its war is on intellectual confusion; and, through the instrumentality of the idea, a world of intelligible order must be created. Armed with this weapon, Demiourgos enters the fray; for an intelligent spirit cannot live in a world of confused impressions, as it cannot tolerate a state of practical disorder. The only slavery intelligence knows is that of helplessness and ignorance. Yet each victory which the spirit achieves is but partial. Chaos is driven back but not routed, and reasserts his presence in a problem still unsolved. The forward movement of intelligence is arrested, and mind sees its antagonist face to face. The Gnostics said that Demiourgos brought evil into being. In other words, until ignorance is felt as a limitation by the awaking mind, intellectual evil does not exist. It is the Idea-Wielder who forces Chaos to declare himself. The bounds of knowledge are defined, and points of attack made clear. Mind becomes reflectively aware of discontinuity and the unknown, but merely as the necessary reflection of its own procedure. Practical inefficiency and a sense of ignorance are the poignant stimuli which prick intelligence into action.

The battle which mind wages is many-sided. It is not primitive disorder alone which must be dispelled. There are many ogres of the mind—like magic and miracle, half reason and half Chaos—who must follow. And intellectual confusion is itself but one of many forms in which Chaos confronts the spirit. It faces initial helplessness in the practical sphere, and must achieve the whole tradition of utilization in material things. It is born with a bare aptitude for alliance, and acquires a social nature through active participation in human institutions.

Its conduct of life, like its knowledge of things, begins in an experimental attack upon the world and a discovery of the reactions it provokes. The materials of its moral order receive form only as criteria of valuation are slowly defined in a process that never attains finality. Its love of beauty is expressed in that decorative touch which marks everything man handles or creates, as well as in those more completely ideal products which are sought in the fine arts. The scope of idealizing activity is universal. Like the magnet, it draws to itself and rearranges every particle that enters its field.

To give ideal form to the materials of experience has been the preoccupation of intelligence through all time. It is indispensable to conduct as a postulate if not as a theorem; and rational thought is the process in which it is reflectively elaborated. The synthetic product of this treatment in one field is science; in another, philosophy. Art coöperates in the same general task through its function of making articulate the significance which the human spirit finds in its own experience. And practical activity, in its thousand forms, is continuously erecting a structure in which this spirit may live. Everything which intelligence produces is the embodiment of a luminous idea—the triumph of mind over brute matter and its forces, over ignorance and its enslavement, over chaos and its obstacles.

To find ourselves at home in the world, its content must conform to our mental organization. The range of our understanding, use, and enjoyment of things reflects always the degree to which such congruity has been worked out. Upon this problem, the mind is unceasingly engaged. It wills to create objects of practical use; it wills to create beauty; it wills to create rationality in its world, seizing upon those elements of experience, those aspects and relations of things, which afford a basis for its ideal forms.

In conduct—that is, in practical reactions to objective stimuli—this many-sided activity of mind has its rise. Knowledge in its primitive form is utilitarian in both impulse and outcome. Logical thought and aesthetic contemplation, as permanent constituents of human life, imply a stable physical existence assured by knowledge of the earth's resources and ability to turn them to account in sustaining life adequately. The provision of this indispensable basis of all higher activity begins with the control of the body in reacting to sensory stimuli. Such adaptation, in its turn, depends upon the sensitive response of consciousness to changes in the external world. Yet, even in this field of adaptive reaction, it is never the intrinsic impressiveness of the individual stimulus alone which gives it value, but the relation it bears to the mind and its purpose at the moment.

When a system of elements is thus abstracted and made the starting point of classification, when it becomes the type of a group or the exemplification of a law, the connections made between fact and fact are not determined by an external and necessary order, but represent equally the incidence of ideal attention in giving form to an intelligible system. Stripped of the preconceptions which guide our reflective analysis, the world does not present a series of segregated types, but continuously graded individuals. Lawlessness as well as lawfulness exists within its bounds, disconnection equally with symmetry, discord and chaos as really as order and cosmic harmony. But intelligence persistently neglects the presence of anomy and seizes upon those elements which compose a unity. The mind of man is never without a specific purpose, practical or theoretical, constituting a principle of organization under which the materials of experience are rearranged. By means of such rearrangements alone are these materials to be mastered and controlled.

The instruments with which the mind works in creating an intelligible world out of the stuff of experience we call concepts. They are synthetic principles according to which the elements of reality are apprehended, explained, and unified. Their function is manifested in giving to the world order and rationality, utility and beauty, purpose and value. Such conceptions are the product of a slow intellectual development which is reenacted by every human society in its progress toward civilization and by every child in its growth to mental adulthood. Man's first uncritical reflection leads only to the general expectation of recurrence. Events fall into two classes, a more common in which the observed connection is repeated, and a rarer in which it is broken. Failure and fulfilment of expectation, at this stage of culture, are equally accepted as facts. Arbitrary and capricious powers appear on the theatre of events, along with those which are consistent and unalterable. Wonder and miracle lie imbedded in the world's structure alongside of established and predictable order.

The habit of thus conceiving the world in terms of disparate principles dies hard. It yields only before the slow extension of law as the investigations of the scientist are pushed farther and farther, bringing one range of phenomena after another under control. At first, it is not perceived by the scientist himself that the presence of universal and necessary law is a fundamental postulate of his thought, that the conception of uniformity is not established by the slow accumulation of evidence but constitutes the indispensable basis of every conclusion he draws. As the connections of phenomena are more and more clearly discerned, the region of anomy undergoes progressive limitation; the world of magic and miracle disappears; necessity supplants chance in the thoughts of men, until the realm of experience is finally viewed as a consistent and rational whole wherein every change is conditioned by uniform antecedents and is expressible in terms of natural law.

Between the theoretical limits of a world of magic and the postulation of universal or necessary law, the evolution of this concept presents the possibility of an infinite series of modifications. What has been called the uniformity of nature is the methodological assumption on which all investigation proceeds; and the advance of science is measurable in terms of the field which it has redeemed from chaos and conceived in the light of this principle of intelligible order. But, in certain of its relations, this conception is even now scarcely more than a theoretical postulate which expresses a logical conviction as to the nature of the world and inspires a persistent search for laws of causation. It formulates the belief, in regard to each unreduced phenomenon, that its apparent contradictions will be resolved and that the logical canons which have guided intelligence to a triumphant conclusion in other fields must ultimately be found valid here also.

The system of concepts epistemologically defined is thus wider than that of scientific or philosophical reflection—which may be called the field of logical concepts in its narrower signification—and includes all synthetic principles in terms of which experience is treated. Their application makes of the world not only a systematic problem for the understanding but also an harmonious object of sensuous or ideal contemplation and a theatre for the moral and practical will in all its manifold activities. To conceive the relation of means to end in practical affairs is the realization of a synthetic principle of this kind quite as much as is the formulation of hypotheses in solving an intellectual problem. To apprehend the use of an object, to combine utilitarian materials in a new way, to invent a machine, to develop an industry, to turn a practical situation to account—these exemplify the activity not less than formal argumentation and the inductive investigations of science. It is also exhibited in the subordination of an impulse to prudential regard, in submission to rational discipline, and in the fulfilment of duty as part of an ideal of character.

In moral and practical life, the form of synthesis is obviously subjective in origin, representing an ideal purpose. It is rather in the field of logical reflection that it becomes necessary to recall its presence. In our contemplation of the natural world, we are prone to overlook this essential contribution of the mind, and to imagine a determinate and purely objective order which is step by step reflected in the empirical development of intelligence. In the aesthetic field, as in that of logic, the mind falls into the error of conceiving an objective determination—as well as a sensuous support—of its ideal forms, whereby beauty becomes a fact, and appreciation its recognition. But the essential feature of a beautiful object is the unity which all its parts compose, a unity which is first subjective or ideal, and may, without losing its vital existence, remain forever a disembodied vision.

The idea, in such a case, is objectified in order that it may be rendered more vivid and impressive, in order that it may be generalized or published, and in order that it may be made enduring and thereby permanently accessible. The mind is the home of all aesthetic forms. Objective existence does not condition their reality, nor is it necessary to it. But the mind finds itself insecure in the possession of such forms of beauty. They fade and are dissolved in the endless succession of images. It is to supplement this imperfect retention that the objectification of aesthetic ideals is undertaken. The vision is reproduced in enduring types of line and color, of brass and marble, or translated into representative symbols as in poetry and music, solely in order to secure these desiderata.

The underlying motives in these diverse forms of synthesis, intellectual and moral, practical and aesthetic, logical and sentimental, may be reduced to two general types, one primary, the other secondary. The first includes all reconstructions which are of value in themselves; the second includes all undertaken for an ulterior purpose. Practical invention is an example of the latter; aesthetic creation, of the former. The one is a means to an ideal end; the other is an end in itself. Our formulations of experience either make possible the attainment of some end which is desirable, or their results afford immediate contemplative satisfaction. In any such series one must ultimately come to that which is good in itself, which has a resident and intrinsic value, not to that which is merely transitive and instrumental.

The reduction of experience in which reflection is engaged has thus two values: the one is utilitarian; the other, aesthetic. In the conception of our practical activities, utility is fundamental and needs no exemplification; but the aesthetic satisfaction which these reconstructions afford is no less real and pervasive. It appears in the contemplative pleasure which good workmanship and successful adaptation arouse, and is expressed in saying that every true craftsman is an artist. Not only does this conception appear in the subjective point of view from which an object of utility may be regarded; it is also manifested through the objective mould in which such objects are cast. Every manufactured article presents features which contribute in no way to its use, but derive solely from the will to create and delight in forms of beauty.

Moral values are similarly reducible. Actions, like things, are called good either because they are useful or because they are beautiful. Worth springs, in the first place, from their utilitarian significance. In this quality, prudent, helpful, and just actions alike share. If their extrinsic relations be lost sight of, it arises—and can arise only—from the immediate appeal which their qualitative character makes to us. In the former case, goodness is a matter of practical utility. In the latter, the moral quality has an ultimate and irrational value which can only be called aesthetic.

The conception of intellectual value is similarly composite. The term denotes either the utility of a conception as an instrument of thought, as when a new idea provides that formulation of experience without which rational action cannot take place; or it represents some element of immediate worth which the idea possesses, such as its simplicity or consistency. To value a conception in this absolute manner is to make of it an aesthetic object. Thus the formulation of ideas helps us to live, for it makes possible a more complete adaptation of our acts to the changes in the world about us; and it helps us to happiness, because we delight in rationality even as a reflective abstraction. The principle of unity, for example, aids us in the practical business of thought, because it reduces the enormous bulk of our experiences to order, and enables us to grasp and understand it. But we apply the principle also where no such practical issue is involved and where the procedure can reflect only a fundamental predisposition of the mind. It is perhaps just because of the incomparable service which it has rendered in our attempt to understand the world that this concept has been endued with an absolute value and that the contemplation of it has taken its place among our purest intellectual pleasures.

The reflective reconstruction of experience begins in the individualizing activity of attention. The impression must be distinct and lasting if it is to be made use of in the subsequent syntheses of consciousness. On our ability to discriminate and identify the contents of experience, to retain and recognize their essential features, depends the possibility of rational conduct and logical thought alike. It is only by thus seizing and isolating the impression that we are able to give to an object individual existence in our consciousness. The fluid continuum of experience must be broken up into discrete moments and independent units if it is to become the basis of either reflective analysis or adaptive reaction. This is the first stage in making experience intelligible. It is not conceptual thinking, but its rise makes conceptual thinking possible. Its product is the *that* of experience; in logic, it is called the subject of discourse. It is the ultimate point of reference in all our thinking and the object to which every practical reaction is directed.

In this process, the stream of impressions is arrested and a single factor, elevated from the rest, is detained before the mind. The latter is thereby individualized, and now no longer exists merely as an indiscriminate element in the general flux. Any constituent or complex of experience can receive independent existence only through this reflective detachment from the succession in which it primitively existed. The individual is not thereby analyzed or defined. The exploration of its nature is still to be undertaken. Its characteristics must be determined and described, its classificatory position and relations to other things worked out, and the history of its development and decay formulated. But, the moment the finger of consciousness is laid upon such an element in the hitherto continuous and unresolved stream of experience, it becomes the subject of all predication and of all law.

In this act, the formal condition of the mind's logical activity is already given in its completeness, though its whole specific content is still to be developed. For so long as the impression has sufficient individuality to be attended to and the selective activity of consciousness has seized upon and isolated it, the single essential requirement for analysis and predication is given. The impression can be retained and recognized on its recurrence. It may be identified in the midst of new associates. Its character can be explored and described. It is comparable with other impressions, and may be referred to a type or subsumed under a law. It is marked by individuality and unity; it possesses substantiality and permanence; it is a potential class, and dichotomizes the world in which it appears. The emergence of the individual impression from the stream of experience and its retention before the mind is thus the starting-point of all subsequent thought about the world.

The richness of experience, however, confuses the mind by its multiplicity and variety. Even though the quality of an impression be distinct and highly toned, it fades and fuses with the irrecoverable past as successive experiences displace it from the centre of consciousness, and in after-life its features cannot be disentangled so as to become a starting-point for discriminative thought. Much of each moment's content must thus be forever lost. We cannot deal with its fluid multiplicity. If a system of knowledge is to be built up, it must be by the neglect of all but some single element of the complex, which is seized and integrated with something that has gone before under the conception of logical or practical significance. The stream of impressions is thus arrested, the order of experience broken up, and its elements are rearranged in the service of an ideal of the imagination.

If the mind is thus to abstract and isolate in order to deal with the system of impressions, it must have an instrument by which the results of analysis may be fixed and indicated, so that in after-thought they may be recovered in independence of the coexistent multitude of elements with which they had no logical unity. It is this service which the invention of names renders. By means of names, we fix these individualized impressions. By means of names, we retain and revive them when they have lapsed from consciousness. By means of names, we make known our experience to others. Without verbal signs, we should find ourselves helpless before the vast manifold of changing impressions.

The verbal term carries always an ideal and formal signification. It serves to revive not the original impression-complex but the results of our own analysis. It denotes not a section of the fluid stream of experiences but the system of related elements which the mind seized and unified at a given moment. Names thus record our reflective activities and constitute landmarks by which we are enabled to retrace our steps across the shifting phenomena of experience. The permanence of meaning is expressed in names. They represent the system of constants which the mind has constructed and isolated. In them lies the means by which the primal flux of intuition is arrested. The name detaches the individual—whether concrete or abstract—from the fluid multitude in which by nature it is embedded, and assists us in conceiving it as a separate mental object. On the reappearance of such an individual as part of a subsequent experience, the name helps the mind to recognize it and to hold together in a new unity the series of experiences characterized by its presence.

Names are thus the most important guides which the mind possesses in approaching its general task. They constitute a record of past achievements, and enable it to formulate new points of departure. The definition and delimitation of groups is implicit in all processes of naming. Distinction and definition, like individuation, are indispensable to reflection. No identification can be made, no system arranged, without definition, explicit or implied. It is one of the mind's characteristic procedures, though not its sole preoccupation; and the number, precision, and systematic relations characterizing the definitions which a mind has achieved reflect the comprehensiveness and rationality of its conceptions.

But the interest of intelligence, after all, lies not in definitions and laws as such, but in their application to the facts of experience. One of the most subtle temptations to which reflection exposes the mind is offered by the logical process of definition and formal classification itself. The thinker finds pleasure in the mere pursuit of a representative symbol instead of continuously translating it into terms of those original values in the service of which it was called into being. A conception which has not been formulated to help us in dealing with the facts of experience is both useless and dangerous; for it may thus lead us to substitute a fiction of the imagination for those realities in which all mental forms alike have their origin and point of application. Conceptions are the necessary instruments of our reflection upon the infinitely varied field of experience, but it is a vice of mind which exalts them to a position of absolute worth. A system of precise definitions is indeed indispensable to exact knowledge; the progress of science, in consequence, is marked by constant reformulation of its conceptions. But the functions of terminology are abused when we create any final classification in a field whose boundaries or internal relations have not yet been clearly conceived.

In this procedure, a general method is involved which looks to the whole field of phenomena as its object. That mental predisposition from which the first act of naming springs, cannot be arrested. The totality of phenomena must be reduced to order by combining its elements in systems of related individuals, and arranging these groups according to their character in higher and still higher classes. At each level, the constituent groups are united under concepts similar to those by means of which the ultimate individuals were themselves integrated.

This process, classification, is the second phase in the mind's treatment of phenomena. Its ideal is a unitary system of concepts, the connections of which are expressed in terms of likeness and difference. Between one pair of individuals, the resemblances will be few and superficial; between another pair, they will be numerous and profound. In such a logical scheme, every individual will find a place, and each will exist in specifically determined relations. The assignment of its location in such a scheme defines the nature of a thing in terms of that whole series of characteristics of which the classification takes account. To work out this system of relationships and to express its form in a hierarchy of concepts is the general task of descriptive science.

From this point of view a science is a system of generalizations concerning a particular class of phenomena. Every individual fact has a dual nature. In one respect, it is unique, whether we regard its general form or its qualitative modifications. In another aspect, it is generic, and enters into the composition of a group marked by common characteristics. This community, making it possible to represent the fact under a type, conditions the existence of science, which deals solely with these recurrent conceptual types. The so-called facts of science are thus never intuited realities but abstractions from experience. Every intuition—and every element of experience—is, in its immediate quality, both incomparable and incommunicable. The "general fact," on the other hand, is a law, a formula which subsumes many individual facts or occurrences, in so far as they present certain uniformities. Science deals with these general forms alone. That which cannot be conceived in terms of its relation to other things falls beyond the scope of its treatment—it is pure experience. The possibility of description, and therefore of science, begins with the application of general concepts to the content of intuition.

Obviously, then, the scientist's point of view is highly specialized; and, in one meaning of the phrase, it may be said that he is not interested in *things* at all. His task is to describe in general terms the properties of classes of objects; their purely individual characteristics do not concern him. What interests him is the connections among things, not their unique qualities or values. The perception and appreciation of these two orders of reality constitute wholly independent forms of mental synthesis. It is one thing to determine the law according to which a given event occurs; to detect the individual recurrence of such an event, or to seize upon its practical significance, is quite another. Unlike points of view, even distinct intellectual qualifications, are involved in these typical reactions to experience. An ability to determine in some particular the intelligible order of the world in no way involves the possession of practical sagacity in dealing with the class of facts in question. Logical reflection upon experience and inventiveness in practical affairs are both indispensable elements of a rational life; but the habitual predominance of either one in an individual mind makes it correspondingly difficult to pass with facility or success to the alternative mode of conceiving things.

In order that a logical treatment of experience shall be possible, there must be devised a system of common standards from which the series of judgments may take its rise. Phenomena which are not comparable cannot be incorporated in a single system. Science, which systematically aims at such an integration, may therefore be defined as the treatment of commensurables in terms of their common measure. The characteristics of a group of phenomena may of course be defined either in qualitative or in quantitative terms. The field of homogeneous light, for example, is describable as a series of sensible color differences or as a system of light waves and their periods. In any given instance, the qualitative treatment of phenomena may either be demanded by the specific direction of the will or necessitated by the fact that a quantitative method of approach has not yet been devised. In the service of reflection, it nevertheless becomes wholly inadequate through its failure to provide a scientific basis for the general correlation and prediction of events. If, therefore, the subject-matter of any science does not itself afford a quantitative basis of comparison, it must be sought in a system of associated or conditioning phenomena in which such a constant is to be found. If no measurable conditions can be discovered for a given class of phenomena its scientific treatment is rendered impossible.

The inquiry for a quantitative unit has been most successful in the field of physical science, where the theoretical constant has attained a high degree of definition. The specific unit varies from class to class of phenomena, according to the nature of the commensurability sought; but, in all cases, it is founded upon the conception of determinate motion among material particles. In mental science, on the other hand, the intrinsic nature of the phenomena obstructs the attempt to apply a quantitative method of comparison. The psychologist, therefore, turns away from the content of immediate experience to its physical concomitants in order to reach such a system of standards. The units are not themselves psychical in character, but are available because in the system which they constitute lie the general conditions under which mental activity takes place.

In physical changes are to be found the stimuli upon which modifications of consciousness depend, and the materials through which its activities are expressed. If processes of consciousness be connected systematically with physical changes, which are themselves measurable and comparable, it becomes possible to arrange the mental events in series determined by the form of the physical process with which they are correlated. If one cannot define in quantitative terms the difference which separates two just discriminable impressions, one may determine the series of magnitudes presented by the physical change with which the perception of difference is correlated. To make this affiliation systematic is, indeed, the business of experimental psychology.

The method of classification does not involve any specific concept as its basis. It simply defines the habit of the mind in forming general ideas as a means of dealing with individual fact. Each classifying act represents a distinct purpose, the number of which is unlimited. An individual may thus be treated in a multitude of ways; it is a potential member of many classes. No classification, nor any number of classifications, exhausts reality. Each concept, on the other hand, represents a system which potentially embraces the universe. The only principle, therefore, which limits the function of classification lies in the restriction of the field of phenomena itself. Within that field, it implies an inclusive or rationally complete system of concepts.

The process of defining and naming, of conceiving individuals in terms of fixed characteristics and referring each to its place in a logical scheme, provides the necessary data for the final operation of the mind in dealing with phenomena. The field of this activity is the interaction of things. The world is treated dynamically as well as statically. The subject of specific characteristics is also the origin of certain effects. It has its place in a causal series as well as in a classificatory system. To the conception of a world of quantitatively determined objects must be added that of a web of processes in time. The logical relations of likeness and difference, in other words, must be supplemented by the empirical relations of cause and effect, of genesis and historical origin.

To connect events in this way is to explain them; for explanation, in science, is purely an inquiry concerning origins. The world as a system of objects can only be described. To be explained, it must be conceived in causal terms and regarded as a system of orderly successions in time. These two undertakings are logically independent. It is true that description is successful only in so far as it embodies relations whose form is to be explained by reference to the genesis of the phenomena in question. But that is only to say that the description must actually describe; it must conform to the facts. There are not two orders of reality involved in the case. The existing system is a stage in causal or historical development.

In classifying such a system of phenomena, whether one be in possession of the formula of evolution or not, the result—if the classification is to be valid—must be one and the same. Historical investigation is, therefore, of great importance to the systematist, for the principle of development becomes a general guiding concept in formulating the logical scheme at which classification aims. But this should not lead us to confuse the two functions. To classify, even though one may have worked out the genetic relations of the things classified, is to deal with individuals conceived as fixed units. Questions of cause and origin are not raised, for the very idea of change is foreign to such an undertaking.

In the metaphysical conceptions of substance and activity, this dichotomy has been carried over into the field of philosophy, where it affects the treatment both of the human spirit and of the general conditions of existence, or absolute reality. It has thus given origin to distinct ontological points of view and schools of thought. The one defines soul in substantial terms; the other construes it as energy or function. In the one philosophy, God is conceived as the ideal form of activity which the universe presents; in the other, as the metaphysical ground of being in which all individuals have their existence and unity.

In the work of explanatory science, the conception of change is fundamental. The phenomenon is conceived as the outcome of determinable antecedents, or causes, and the origin of predictable consequents, or effects. The only explanatory principle which is applicable to a system of phenomena is that of causal connection. Natural science rests upon this assumption and excludes all other conceptions, such as that of teleology. Historically, the explanations of science have been supplemented at each stage by conceptions dependent upon the assumption of purpose or function. But every such recourse represents a failure in the scientific undertaking, if not a loss of the scientist's vision. Its interpolation indicates either the presence of an unresolved problem or a confusion as to the nature of scientific explanation.

The ideal of science is, from the methodological point of view, perfectly clear. It is to determine the atomic constitution of the world and to formulate the mechanics of its changes. The particular constitution of the units and formulas with which the scientist works, may change from age to age, since these are necessarily provisional and relative to the level of analysis attained at any given time; but the formal ideal of all analysis is unaffected by such changes, and remains theoretically constant. The unit must be simple; the formula, universal. No ultimate difference among the constitutive units, and no partition of the world between irreducible types of change, can be admitted. This is the fundamental assumption from which the scientist cannot allow himself to be swerved by any complication of the phenomena to be treated or any difficulty in their resolution.

Such a postulate can be maintained only in view of the fact that science is not an attempt to exhaust the account of reality, and that its presuppositions constitute but a necessary methodological delimitation. Reality is viewed by man in a series of differing relations, each of which involves a specific set of such presuppositions. With none of these other points of view, however, can science have even contact; and the penetration of his own field by the conceptions to which they give rise leads inevitably to the disorganization of his results.

The traditional form in which this adulteration of scientific method has been manifested is the employment of the conception of creative agents, spirits, essences, and powers as explanatory formulae. Angels and demons, entelechies and souls; function and purpose, reason and end, force and will; vitalistic, soporific, and morbific agencies have been invoked in turn as explanatory hypotheses. It may be that human reflection has need of this whole class of conceptions in its complete review of reality; but, in the special work which explanatory science undertakes, it can afford no help whatever. Each relapse into such modes of thought marks the point at which scientific analysis has stopped, and amounts to nothing more than the confused recognition of an irreducible element in experience. This the scientist must recognize as well as any other; but it is an absurdity to make of it a constitutive or explanatory principle. It affords no means of analysis; it determines no specific change; it contributes no formula of relation. At whatever level it appears, this conception stands only for the unresolved residuum by which reflection is faced.

Thus, in the study of organic life, the biologist may find himself unable to state the facts of development in terms of the known chemistry of the cells, or of the local relation of parts in the segmented ovum and their polarities and bilateralities, or of the influence of external agents upon the organism. But it is nevertheless inadmissible to formulate the problem in terms of a conception which falls outside of this whole system of principles and to say that, since the chemical and mechanical conceptions which we are now able to apply to organic development prove inadequate to the statement of that process in its entirety, we must conceive it as autonomous and treat it in terms of entelechies.

Autonomousness is a conception which has no place whatever within the scheme of science, because it applies only to things in their self-dependent totality—with which philosophy deals—and not to things in their relations to other things, as science must conceive them. It is only in terms of their interaction that the empirical reason can explain things at all; and, in the case of organic development, as of all other processes, explanation must be sought through the determination of specific causal relations. This mechanistic conception of science is a purely methodological assumption into which no ontological meaning is to be read. Its nature is misunderstood when, for example, it is called materialistic. It applies also to all facts which fall within the domain of science, whether physical or psychical, whatever the metaphysical interpretation which may be given to them.

To explain an event, then, is to determine its historical relations and to indicate the conditions under which its recurrence may be expected. Assigning the object its status in a logical system and the event its place in a causal series are the two general tasks of science. These functions, classification and explanation, are correlative and mutually supportive, for the two aspects of experience on which they rest are not independent. That is to say, there are not two systems, of objects and processes severally, to be treated in different ways. Experience is a continuity and the world one of uninterrupted transformations. Nevertheless the mind in order to achieve its aim must construe the materials of intuition in terms of two general conceptions: as a world of objects, and as a world of changes. These conceptions are of universal application. Inorganic substances and living tissues, physical aggregations and chemical compounds, crystals and organisms, minds and institutions—whatever the nature of any given phenomenon, it must be treated under one or the other of these formal concepts.

Thus the result of any process of classification may itself be described as a problem. It has answered the question as to what relations exist among the group of objects; it raises the question why they exist. Historical science is the answer to this second question. Explanation must be added to description. Science, however, does not explain the event in the sense of interpreting its significance in an ideal order or showing it to be a necessary element in a unitary system. It establishes solely its proximate connections in the time series. Such is the only form of explanation which the assumptions of science make possible. The explanation of events must always be in terms of other events.

The history of natural science also presents these two successive stages. The function of explanation is indeed never absent, but at first the student concerns himself chiefly with classification and description. Later comes the work of determining the causal or genetic relations among phenomena, and of working out the formulae of their development. Thereafter a return is made to the task of classification on the basis of the historical principles thus established, and the work of descriptive science is corrected and unified. This transition is seen in the history of philology when the formal analysis of words was succeeded by an inquiry into the history of their changes in diverging from common root-stocks as the basis of systematization. It appears in the relation of Agassiz's classificatory zoology to the explanation of its forms by the application of the concept of genetic relationship. It is seen in the supplementation of the analysis of political institutions by a study of their historical development, and so on.

The application of the developmental concept is not restricted to any science or group of facts. It is a principle of general method which simply represents the treatment of the world as a process in time. The conceptions of causal sequence and genetic relationship are but special modifications of the principle of historical method. It is the application of this point of view which has given origin to the whole system of concrete sciences in modern times, imparting life and significance to schemes of classification which primarily had merely formal value. It provides a rational basis for a multitude of special laws; and, in its light, astronomy and geology, botany and zoology, psychology and sociology, have been reconstructed. Thus, in any field, the very elaboration of a classificatory scheme, or the working out of a system of special laws, suggests a new series of problems which it is the office of historical science to solve.

In the formulation of a system of descriptive concepts or explanatory laws, the student of any group of facts must primarily be guided in his reflection by the needs of his own special work. Material truth is the aim of all scientific procedure. "Back to the facts!" has been the rallying cry of all reformers in periods of oversystematization and an interest too purely logical. Actual phenomena and their connections must be both the starting-point and object of final reference in explanation. Science achieved freedom when its point of view in this regard was first clearly formulated, and its continuous progress was assured only when, at the beginning of the modern period, its application became the general guiding principle of investigation.

There was thus cut away at one stroke that whole group of fictitious problems, having its origin solely in the logical relations of thought, with which the so-called science of the Middle Ages was burdened. The clear envisagement of this truth leads also to the suppression of those metaphysical formulations which have been so persistently obtruded into the field of scientific description and explanation. If interaction among the objects of the physical world presents a perplexing problem for philosophical reflection and its difficulties lead the thinker to postulate an atomistic pluralistic universe, his embarrassment must be understood as a purely metaphysical obstacle. One must not commit the absurdity of conceiving that there is thereby necessitated a denial of connection among the changes of the phenomenal world. These observed connections constitute the immediately known reality. The sequences of experience cannot be doubted, simply because they are the original datum from which reflection starts, the epistemologically given. In that world, interaction most certainly exists; for the term, as used in descriptive science, means no more than just these connections among the intuitional content of experience themselves.

Thus if psychophysical correlation be empirically given, the fact is neither negated nor modified by the objection that it is inconceivable that any physical change should bring about an activity in consciousness. The qualitative disparateness of objects intuitionally is one affair; their logical correlation for the purpose of describing the order of experience is quite another. Nor, if the problem of disparateness be raised, can the question be restricted to the specific field of psychophysical relationship. In the final analysis it has its point of application in every qualitative treatment of experience, and affects the simplest events as well as the most recondite.

The representation in consciousness of the mode in which one change conditions another, as contrasted with the observation that it constitutes its uniform antecedent, is equally impossible in all cases. The specific qualities of water are no more deducible from its constituent gases, oxygen and hydrogen, than a sensory quality is deducible from a study of the constitution of the nervous system. For science, all things that are actually connected in experience are logically associable in thought. The problem of qualitative likeness or difference in the terms of association should not even be raised. Whether they are identical or mutually exclusive is a matter of indifference, if one's aim be solely to observe and record the fact of connection.

Thus, in the field of psychology, the relations between classes of physical stimuli and qualities of sensation, between the administering of a drug and the reaction in consciousness, between the intention and the act, between the presented object and the associated thought, between one's question and another's answer, are connections actually given in experience. Now it is just these systematic associations presented by experience, and nothing else, which the psychologist is engaged in studying.

Thus, also, in our treatment of the phenomena of animal behavior, it is utility which determines the field to which the conception of mind shall be extended, whatever be the specific criterion upon which the delimitation turns. The logical aspect of the problem which the distribution of consciousness presents to philosophical reflection cannot be allowed to determine the scientist's procedure. It may be that, if one attribute consciousness even to his human neighbor, he will be logically driven to extend his ascription point by point until the whole world of matter and physical change is endued with the same aspect of inner significance and activity which constitutes his own conscious being. But this metaphysical formulation in no way invalidates the distinction which the scientist draws between mental and physical reactions, or lessens the usefulness of the division of organic responses into two series depending upon this distinction.

When it is remembered that, for science, the meaning of all such concepts is their serviceableness in the description of concrete experience and nothing more, both the inevitableness of their adoption and the provisional form which they necessarily take will be recognized. The plea for suspension of judgment in scientific matters, which is so frequently raised, may readily be misunderstood. In one sense, it is meaningless. Science cannot suspend judgment, since the formulation of judgments is its general method and task. The moment interest is aroused, the judgment-forming activity is set up. Every intelligent observation is guided by a judgment and has a judgment as its objective. The essential function of science is to formulate the relations in which phenomena stand; and its progress consists in the elaboration of a system of conceptions which enables it to describe and explain them. To suspend judgment in this sense is simply to arrest the process of reflection itself.

In another sense, however, the suspension of judgment is essential to science. Every scientific formula is relative not only to the special group of facts subsumed by it, but also to the whole system of similar conceptions which science is formulating in the treatment of its general field. Each judgment, or specific law, is a datum for the formulation of a synthetic concept of higher order, and is subject to the requirement that it conform to the organic system of laws into which it thus enters as well as to the ultimate group of facts which it correlates. Every concept is therefore subject to revision, and such suspense of judgment as reformulation implies is involved in all scientific progress. The cry to suspend judgment, when the question is thus raised as to the proper attitude of science toward its own system of conceptions, is really directed against the danger which is felt to lie in hasty or ungrounded generalization, especially when its judgments are not expressed in tentative forms or recognized as subject to the requirements of that general system of knowledge into which they enter.

But this eager speculation which invents a thousand hypotheses and tests and tries formula after formula until the facts are at last successfully organized, this incessant, restless schematizing of phenomena, is the very life-blood of science. It is not the age of speculation when wars of controversy rage that science has to fear, but the time when criticism ceases and existing hypotheses are accepted unchallenged. It is only through verification by trial that speculation can be sifted and true theory defined. On the fragments of her broken hypotheses science climbs; and the abundance of theoretic formulations to which it gives rise is the best measure of the intellectual activity of any time.

While, from one point of view, the existence and character of a science are dependent upon its temporal relations and may thus be measured in terms of the general system of determinate knowledge which it has succeeded in establishing, in another and profounder sense it is wholly independent of such correlations and from its inception has a timeless and necessary form of existence. For the claim of any system of thought to a place among the sciences is not to be determined solely, or even chiefly, by the largeness of its results. The popular definition of a science as an organized body of knowledge concerning a specific class of phenomena is a conception which cannot well be relinquished. It is to the system of truths which has resulted from its investigations that the world looks for evidence of the rise of a new science.

But there is a more essential aspect to the matter than this. Such a system of knowledge, because progressive, is necessarily incomplete. All discrimination between its successive stages is therefore merely relative. It is a science in becoming as well as in being. If it be worthy of the name at any time, it must, in the deepest sense, be a science at all times. So long as the range of facts which it rationalizes is changed, and not its method and point of view, the character of its work remains unaffected. A science is born at the instant in which inductive method is first consciously applied to its subject-matter. Only the subsequent body of knowledge which gathers about it may indeed be said to give substantial reality to the science, since it alone gives continuity to the study. Nevertheless, if judgment as to the scientific character of any piece of work be called for, our decision must hinge upon the consideration of method and method alone.

Not only in the case of science but throughout the work of intelligence at large must this point be kept in mind. Its specific forms are manifold; and the means of approach vary with the aim, as the resultant product varies with the material. In all its activities, however, intelligence preserves its general nature unmodified. It has a common material, the content of intuition, which it remoulds in harmony with certain ideal forms. Whether art or morality or science or invention be in question is indifferent. Metals, pigments, tones, and all the physical materials of the industrial arts, plastic human wills, and imaginative complexes of ideas, alike are conceived as materials for an ideal synthesis, whether its result be expressed in a machine, a poem, a human character, or a conception of evolution.

The soul of intelligence is just this organizing activity itself. Everything it touches bears this mark. What is real for us must at the same time be ideal. The form which intelligence gives is not something added to a world already known. It is a constituent in the elaboration of that world which is enlarged by every extension and altered by every modification of it. Reflection, in pursuing its own task, makes a logical discrimination between intuition and reason, but we must not, on that account, commit the absurdity of condemning the abstractions of our conceptualizing intelligence because, taken by themselves, they do not constitute reality.

## CHAPTER III

## THE ABSTRACTIONS OF REFLECTION

THE general nature of the problem which intelligence confronts in dealing with the materials of experience has now been stated. In its immediacy, the content of intuition presents a fluid continuum, qualitatively manifold but without distinction of form. Into this primitive chaos, intelligence introduces a principle of ideal order wherever it enters, and its product appears in a reorganization of its plastic materials. In their individual embodiments, these ideal syntheses are of infinite variety, but they may be grouped in certain general classes, the number and character of which will vary with both the conditions of experience and the purpose of our classification. Such a principle underlies our differentiation of the system of mechanical inventions from the products of the fine arts; or our distinction of social from political institutions and aims; or our contrast of scientific and philosophical conceptions, and the like.

Now if, among the manifold attitudes of the human will which these products express, a fundamental principle of differentiation be sought, we shall probably find ourselves making a twofold division of the materials of intuition. It is hard to give a name to these discriminated types. No term is adequate and exclusive. One is what the subject is conscious of, the other what he is concerned with. These terms represent aspects of reality, not events distinct in time; for the two are inseparable moments of every individual experience. This discrimination of characteristic reactions to the content of reality may be expressed by the terms *existence* (what one is conscious of) and *worth* (what one is concerned with). It may be marked also by opposing the activity of knowledge or cognition to that of constructive utilization, a distinction which it is important to retain in spite of the obvious fact that knowledge is an outcome of that same idealizing activity which creates objects of use and beauty.

With experience as existence, the cognitive subject is engaged. Intelligence here strips itself of all personal relation to the event, which is viewed as purely objective; and in the ideal product is sought an adequate representation of its universally valid relations. Experience as worth engages the constructive subject. In this reaction, the material of intuition is treated solely as an object of will. Its significance lies in the direction and amount of its force as an impulse to activity. It is a moment in a constructive life.

From the latter point of view, any object or process is looked upon as a totality having purpose and value. The reality of any thing thus lies in its unity or functional significance. Its constituent elements when sundered, are meaningless. They have an intelligible existence only as parts of an organic whole. From the former point of view, on the contrary, any object or event is regarded as a group of elements, a plurality or a succession. Its standpoint is atomistic. The totality exists only as the point of departure for a process of analysis which resolves the object into its constituents, whether material or causal. It is of the latter that permanent existence is strictly to be predicated, in proportion to their simplicity and universality.

Every activity which embodies the worth of experience may be said to deal with its materials in a *creative* way, while every conception of existential relations is a treatment of experience from the *critical* point of view. In its creative activity, intelligence seeks to mould and use, to invent and construct, to appreciate and enjoy. It is a reaction to the unitary quality or significance of the object. The critical activity, on the contrary, is concerned wholly with the analysis of experience into its elements. Its function is the determination of uniformities of connection among phenomena through processes of abstraction. It seeks always to dissolve the structure of experience and to exhibit its irreducible elements in their relation to one another. The unanalyzed object may be a thing of interest, of beauty, or of worth; it cannot be dealt with in any form of descriptive or critical activity.

Both the description of experience and its interpretation in terms of value are forms of reorganization by the purposeful human will. Creative and critical activities alike dissolve the continuity of intuition for the purpose of rearranging its elements in an ideal order. The critical activity seeks a logical reconstruction of experience as a method of rational description and explanation, in response to the demand of the human spirit to understand its world. The creative activity undertakes a practical or sentimental reconstruction of experience as a means of securing a mood of satisfaction, and in response to the longing of the human spirit to enjoy its world. They are parallel in so far as each transforms the materials of immediate experience in the service of ideal purposes; but, in their principles of selection and the systems which result from their reconstructions, they are diverse as the poles.

If the terms *scientist* and *artist* may now be used to point this distinction, scientific work is a function of the subject as cognitive and has to do only with the existence of phenomena. Activity is directed toward understanding, the objective expression of which is knowledge. One's aim is to describe, through generalizations or laws. The object of a description is fact. Its criteria are exactitude and completeness. Accomplishment is truth; failure is error.

Artistic work is a function of the subject as constructive, and is always an expression in some form of the worth of experience. The will is here directed toward use and enjoyment through the products of creative activity. These products represent a plastic treatment of materials on the basis of ideals, and judgment takes the form of an appreciation. The result of an appreciation is value. Its criteria are integrity and power. Accomplishment is holiness (or wholeness); failure is sin. These two series of terms may thus be set in opposite columns as indicating contrasted forms of activity expressed in two great classes of writing which have been called, respectively, the literature of knowledge and the literature of power.

The distinction between poetry and prose, in their larger features, conforms to this principle, and may be used in further illustration of the contrast. Prose is the expression of intelligence as logician and demonstrator. It serves the exploring and describing faculty. Poetry is the expression of human emotion and reflects the appreciative life, in which man is artist and connoisseur. The latter springs from the aesthetic nature of the individual; the former is determined by his intellectual need. The ideal of prose is truth—fulness and exactitude of description. The ideal of poetry is beauty—purity and splendor of impression. The intention of the prose writer is to call up a definite set of intellectual symbols in the mind of his reader, and thereby contribute knowledge. The office of the poet, through habitually depending upon the arousal of such imagery, is to create an emotionally appreciative attitude. Music arouses this reaction immediately; and, in the work of the symbolist or tone-poet, the induction of a mood through indirect verbal suggestion, independent of any specific intellectual content, is erected into a literary principle.

The term "art" as thus used obviously includes a larger field than its common use denotes: it is synonymous with creative activity. For those attributes which are fundamental in the conception of artistic work are not limited to plastic or literary art and its appreciation, but penetrate the whole range of activities which have been set over against critical analysis. It stands not only for moulders of plastic forms—the painter, sculptor, architect, and musician—and artists of the representative image—poet, dramatist, and novelist. It stands also for the biographer, the historian, the actor; for inventor and plotter, for educator, reformer, and saint—moulders of those plastic materials which we call human emotions, impulses, acts of will and faith.

This whole activity of intelligence, in its principles of selection and typical products alike, presents the sharpest contrast to that reflective analysis which science undertakes. It is, of course, also true that the one reaction may replace the other in individual experience as a series of swift and unpredictable oscillations. Each field is therefore subject to invasion and confusion through a failure to preserve consistently that attitude which its general point of view demands. Poetic appreciation is interrupted by prosaic description, scientific explanation obscured by interpretation, and the work of artist and scholar alike marred. Before turn-ing to the reflective understanding and its problem, therefore, this second characteristic reaction of intelligence must be made clear.

The artist's aim, whether in his aesthetic appeal to the appreciative subject, or in his ethical appeal to the active and constructive subject, is to affect, to impress, to move. Selection of material, method of arrangement, and choice of expression are all dominated by this purpose. In aesthetic creation, it is the aim of the artist so to represent the object or event that the effect produced upon himself by the experience or contemplation of it shall be aroused in the beholder. He seeks to communicate his own mood. In ethical creation, on the other hand, it is the artist's aim to communicate his own moral will. He seeks to present the object or event in such a way that it shall transform the grounds of action in his hearer. Not to understand but to feel and to respond constitute one the recipient of the artistic impulse. Power is the test of creative quality. It cannot be defined in terms of knowledge; for it observes no limits prescribed by actual experience; it seeks no transcription of fact; it is bound by no proportion which the historical order presents. The artist freely dissolves and recombines his materials in forms determined solely by that principle of aesthetic unity which it is his function to express in objective forms.

In pure literature, for example, the images called up in the mind of the reader are themselves but symbols which must be interpreted in terms of immediate and poignant intuition. What knowledge it affords is wholly secondary, for instruction has place only as a means of enriching the aesthetic stimulus; and the art is great in proportion as the impression is pure, intense, and sustained. To enlighten the understanding of the reader while his imagination and his heart are left unaffected is to miss the very aim of art.

This vivifying stimulation is grounded in community of experience—in moods of feeling or contact with the sensible world. Though the original pulse and thrill have subsided so that no specific recollection is aroused, our natures will still be vaguely stirred by characteristic emotion upon beholding even the images of things which have deeply touched us in the past. This quickening glow of sentiment, profound though diffused, literary art seeks to arouse through its symbols. It is an organic reverberation of the whole nature, and so far from being articulate and conscious, as is reflective understanding, it is essentially dumb.

Now the inarticulate reactions of life are not of necessity either vicious or confused, nor are they evidence of an untrained intelligence. It is only that, in their grounds and mode of expression, such judgments are to be contrasted with that reflective formulation of experience which is embodied in the sciences. Reasoned criticism adds to dumb conviction a philosophical reflection upon life, but involves no intrinsic correction of its ideals or enlargement of the mental vision.

The reactions of the disciplined critic are indeed characteristically of the nature of immediate perceptions. Habituation has so quickened and refined his sensibilities that truth and falsehood, right and wrong, harmony and incongruity, are apprehended with the intimacy and swiftness of intuition. It is distinctive of apprenticeship, not of mastery, to base its judgments upon articulately conscious reasons. The connoisseur, the trained scientist, the man of sensitive honor, do not wait for such slow deductions. In their natures, individual or racial experience has been organized into a touchstone by which the qualities of things are instinctively tried. The man who is educated in any art or business of life must have so mastered its material and technique that he is able to act with his mind fixed upon the results of his action and without attention to the process involved. The effects of training in any such activity, the study of its principles, the intimate and repeated experience of its affairs must have been funded in a nature so disciplined that each complex situation is reacted to as a simple object.

It must be obvious, then, that this adaptive equilibrium in which the mastery of any art consists cannot be assured through reflection and is only indirectly grounded in it. The artist's judgment that a piece of work is good or bad is not an algebraic summation of points of strength and weakness taken serially, but an impression which arises with instant authority. The logical grounds which give rationality to decisions of the practical or aesthetic will, are commonly discovered only through subsequent reflection. Indeed the invasion of either of these fields by a critical consciousness introduces a characteristic disturbance instead of increasing either the facility of the judgment or its validity. The first attempts to supply scientific principles in any such field are likely to have disappointing results, even though the aim be serious and the conceptions genuinely established. This general relation of theoretical consciousness to its practical applications is to be taken up later, but the distinct nature of these two reactions of intelligence must be kept in mind from the outset.

In the form which its products take, as well as in the methods by which its judgments are attained, this idealizing activity of intelligence is to be contrasted with reflection and its abstract conceptions. The artist-inventor makes known his meaning by setting an incarnated type before the observer, not by specifying the conditions to which it must conform. He produces the exquisite flower, he draws the perfect line, he makes the graceful movement; he uses the tool, effects a sale, acts the part, teaches the child; he invents a machine, wins a campaign, writes a poem, builds a cathedral, founds a religion or a state. He exemplifies instead of defining; and, through an immediate acquaintance with its embodiments, the beholder apprehends the nature of the ideal without formulating an explicit conception of it.

In every one of these reactions, reflective intelligence also finds materials for its analyses; but it has a different motive, and gives rise to a distinct order of products. Reflection lays bare the structural principles which are embodied in the machine or the picture or the moral character, and seeks to establish the historical conditions under which it arose. It studies the elementary constitution of compounds, the explanatory connections of events, the logical grounds of action—those general forms or conditions in which all individual embodiments of a type agree, but which in themselves must always fail to provide a sufficient basis for the invention of a single representative in the field of creative art.

The result of reflective analysis is neither an individualized objective product—an embodied idea—nor an imaginative anticipation of such a product. It is a logical conception, an ideal schematization of constitution or relationship which in its very nature can have only a subjective existence. The two activities may thus be said to have opposite directions and complementary values. Science explains the individual object by integrating it with a larger system; art interprets the wider system by representing it in an individual object.

Science, therefore, expresses its results in abstract universals, but art in concrete particulars.

The aim of science, as already pointed out, is to give a systematically complete account of phenomena, under the conception of continuity and interdependence. Every object the scientist analyses, every event he explores, is part of a system within which disruption is unthinkable. The isolated object is an unintelligible fragment. Self-dependence and completeness are nowhere to be found within that theoretical limit which is called the universe. The individual, instead of being a detached and representable unit, is itself destroyed by severing the vital set of relations through which it is caught up into the web of existing things. In science, no arrest is possible short of the whole intelligible world.

In such a system, it may be said that the regulative conception of worth must be assumed; and, in a sense, this is true. In descriptive analysis, all facts—all resemblances and differences—are not of equal value. Wherever there is systematization, subordination of lower to higher exists, in logical reflection as well as in ideal valuation. But, for the scientist, the criterion of worth is richness of relationship, nothing more; that is of the greater importance which has the more manifold implications in its nature. Thus, a structural homology is of more significance than an analogy of function. It represents the deeper relation, the wider law. Reflection is itself just the search for these pervasive identities of structure and occurrence. Knowledge always transcends the data on which it is based, and, in its very movement, leads the mind beyond the object with which it is concerned toward an ever-widening system. The ultimate aim toward which all inquiry is directed may, therefore, be defined as the complete expression of the world's relationships.

Within the limits of art, on the contrary, the principle of unity is immanent. It is this systematic integrity of purpose or design, wherein the functions of every part are comprehended and fulfilled, that determines the composition of a picture, the construction of a building, the writing of a poem, or the formation of character. The creative will is a harmonious system of powers in unimpeded action. The ideal product of art is a system of elements in which every impulse aroused finds satisfaction, because each idea which penetrates it is reflected back and finds its reciprocal within the limits which the work comprehends. Only that which is thus complete in itself can be detached and found to afford contemplative satisfaction.

The system of relations embodied in any such product of art, on the other hand, presents infinite grades of complexity. A deed may be artistically satisfying, or it may be an element in a perfect life. A single figure in a group of statuary may have isolated perfection as well as functional indispensability for the whole composition. The lyrics within a play may have as absolute flawlessness as the dramatic unity of successive moods in which they appear. The dancing girls of Botticelli's *Spring,* the cherubs or flute-blowers of Bellini and Carpaccio, the three Fates in the pediment of the Parthenon, are beautiful units within the greater syntheses of composite groups. A score of Shakesperian lyrics—like the *Sea Dirge,* and *Take, O Take Those Lips Away*—though incorporated in complex dramas, detach themselves at once in virtue of their essential artistic completeness. Thus it is not its complexity of constitution but its individualized form as an intuitional object that marks the product of creative activity.

It is the function of art to create, and of the appreciative consciousness to find, in the single object or experience, a representative of some universal type. The ideal is condensed and expressed in an individual, and its splendor is measurable by the simplicity of the symbol and its compressed suggestiveness. A sketch or fragment may reveal beauty more impressively than the finished work, for the more complex the material introduced the less completely can it be made to express a single aesthetic type. The whole energy of artistic constructiveness is devoted to the production of these concrete embodiments of the ideal. Beauty, like use, is always specific. Perfection cannot be attained by progressive fusion of types or values. The method of generalization—which is fundamental to science—is therefore excluded from art by its constitutive principles. This fundamental difference in direction of interest underlies the misunderstandings which arise between the scientific student of any class of facts or relations and those who deal with them practically.

Nevertheless these contrasted activities of intelligence both deal with the common materials of intuition, and spring from the unitary subject of experience. They should be not disparate but complementary. Though representative of diverse methods and aims, reflection and action should have a final meeting-point in the world-conceptions to which they lead, as well as a common origin in immediate experience. This identification is achieved in the two characteristic supplementations of empirical science and plastic human art, namely, in metaphysics and religion.

The underlying motive of all descriptive analysis is the desire for a unitary conception. It is the expression of an endeavor to view the world as one rational system. In metaphysics, the mind, in transcending the limits of empirical science, postulates a subject for whom experience is the complete expression of reality. Reflection and intuition coalesce in a system of knowledge which can be stated only as the apprehension of existence in the form of an artistic whole. This intellectual reaction is not represented in that elusive sense which sometimes thrills us with the significance of life and being—a mystic insight into the mighty whole which cannot be put into intellectual forms—but in that adequate realization of all its attributes and connections which we ascribe to the divine or universal mind. The apprehension of reality as such a unity, in which the meaning of every part lies wholly within the system and nothing leads the contemplative consciousness beyond its bounds, is what constitutes the aesthetic attitude; and the system of elements which can thus be contemplated is what we mean by an artistic unity, or perfection.

It is obvious that this whole system of products—the art-invention series—stands in more intimate contact with the immediative qualitative content of intuition than does the system of abstract conceptions to which critical reflection gives rise. But it is perhaps not so evident that, in the world of empirical reality, there is nothing, even in the field of perception, which does not exhibit the principle of subjective selection and rearrangement. When the realm of sensible objects is reached, we seem to have left behind the very notion which underlies both science and art, and in the apprehension of a thing, person, or event, to have entered a domain in which we confront the irreducible minima of experience.

These forms, one is tempted to say, are immediately given, and involve no recondite processes of abstraction or reconstruction. Yet even these entities, at once the lowest and the highest with which we deal, are the product of an ideal synthesis as real as that which scientific law itself represents. Individuals are the most familiar of our constructions, since they are involved in every act of intelligence. They are the most daring, since they represent the final act of that logical series in which, taking a group of elements as our datum and having conceived an organizing principle by which it may be combined, we fuse the elements into a unitary total to which thereafter we respond in a psychologically simple reaction.

The synthetic unity under which a manifold of sensible data appears as an object, cannot exist in the datum and be impressed upon the mind as that mind receives its material elements. An individual is constituted through the ideal unification of parts organic to the whole. Every sensible thing is such a unity of organized parts. Its existence before the mind is rendered possible only by the presence of that synthetic principle which is made to run through it, the conception of purpose and use, of function and interdependence, of symmetry and harmony, of logical consistency, of moral value.

Those entities which we call things are given under the form of space, but the spatial series is reducible to a time-form since its parts can be apprehended only in succession. Though the elements of any intelligible system are thus apprehended in a series of moments, the form in which they are synthesized is unitary and indivisible. The notes of a melody are heard one at a time, and the impressions which the mind grasps at any instant are but a fragment of the tune. The sensuous material streams incessantly into consciousness, and as swiftly slips away. At no single instant can the form of the whole series of stimulations be found in the sensible data. It exists only in the imagination of the hearer, in which the musical sequence is fused into an ideal unity.

This subjective and originating activity is still more patent in the unities of action, character, and plot. The idea of an event is constituted through the introjection of the concept of orderly sequence into the chaos of perceptual change. It is a discrete succession conceived in terms of genetic relationship. An act is construed from the temporal series which its elements compose by virtue of the represented purpose which is made to run through them all and by which alone they receive unity. Each of these is a product of that conceptual synthesis by which a human mind binds together successive moments of experience which are represented as belonging in a single causal or teleological system. What do we mean by personality but an ideal plot through which we combine a series of diverse acts and judgments into a unity of purpose? and what by character but a system of motives interpreted from the progressive indications of individual expression?

In every such case, a set of elements which can be presented only as a succession must be held in solution while the whole sequence is completed, and combined into a form which is ideally originated and can have its existence only in the processes of a constructive consciousness. The entity is given in that moment of insight in which a multiplicity of elements is seized as a unity. It is constituted of any series through which a common thought is made to run, whether its form be dominated by the ideals of the rationalizing intellect, of the aesthetic imagination, or of the practical intelligence.

The world of reality, in its reflective and constructive aspects alike, involves an ideal synthesis of objects, forms, and systems in which the materials of a manifold concrete datum are shaped under the direction of definite purposes and needs. These complex structures, upon which the practical activities of life themselves depend, are sought, maintained, transformed, or cast aside as the attitudes of the human will, in which they have their rise, persist, or fluctuate.

When these ideal forms are fused with the materials of experience in an intuition, they constitute the sensible individuals of empirical reality; and their value is unreflectively affirmed. But when they exist in isolation as subjective schematizations, their status comes at once into question, whether they appear as the intangible yet individualized ideals of the moral and aesthetic will or as the generalized conceptions with which reflection works.

Of these two orders, the former is not to be discussed here. As has been pointed out, the two are identical in principle as subjective syntheses and differ only in their special features. Thus the whole reality of ethical distinctions may be said to lie in the imagination; for dignity and worth, justice, sin, and retribution have their existence solely through the idealizing activity of the conscious spirit. The same is true of political institutions and economic aims, of social conventions and distinctions in character. Though not concrete, they are still realities, and of fundamental importance. It is within this world of intangibles that we live—the world of home and fatherland and faith, of truth, honor, duty, and all values—achieving control of materials and forces in its service and devoting our lives to its ideal programmes.

The status of the second system of ideal forms—the abstract generalizations of reflection—will be revealed by any systematic consideration of the aims of natural science and the specific conceptions with which it works. Science may be defined as the systematized knowledge of phenomena. Between scientific and unsystematic knowledge the difference is one of consistency and thoroughness rather than any essential diversity in objects or methods. Science has exhaustless patience and a genius for detail. It proceeds methodically about its work, endeavoring to make the review of its data complete, perfecting its method of experimentation, framing and rigorously testing hypotheses, until its conclusions have been thoroughly established.

Through patient observation illuminated by a conceptual imagination, the connections of facts are discovered and their quantitative values established. Slowly the range of exact knowledge widens with the application of scientific method until the whole system of phenomena stands forth luminous with significant relations, an organic whole of interdependent elements. No fact now stands alone; it is part of a continuous web, the pattern of which is revealed under the light which intelligence throws upon it. This ideal runs like a golden thread through all scientific work, giving substance and unity even to its fragments.

In our practical study of things, on the other hand, exhaustive exploration is unthought of. Common sense asserts the ability to leave a subject as readily as one takes it up. In the utilitarian study of the world, we touch things only when they touch us, and cannot be burdened with the task of looking at our object with this minute and many-sided scrutiny. We live by precepts, which should be few and pungent. Common sense is expressed in proverbs, as science in general laws. Its knowledge is, therefore, full of lacunae and its maxims are neither consistent nor comprehensive.

Science endeavors to give unity and rationality to this world of common sense, so full of particulate wisdom yet so lacking in systematic principles and logical foundations, by revealing the submerged relations which everywhere continuously unite its apparently isolated constituents. It conceives the world as a system of related phenomena whose laws it seeks to discover. Viewed by itself any fact is unintelligible. To understand it is to apprehend its connections with other things, a work which common sense begins and science carries to completion.

Originating at many independent points, as the incidence of practical motives or leisure for reflection determined, the systematic accumulation of observations and formulation of laws has gone on until, about each centre, that distinct and consistent body of truth which we call a science has grown up. With the progressive widening of the boundaries of such areas of classified knowledge, adjacent fields have come into contact and the adjustment of their relations has become necessary. A system of special laws can no more remain in isolation from the rest of scientific truth and be intelligible than any single fact can remain out of all relation with other facts in our intelligence and still be understood. The work of science is progressive from level to level, from fact to law, from lower law to higher in ever increasing generality, until the whole system of formulae in which its results are expressed have been brought into one consistent and rational whole. The purpose of science is to give a systematically complete description of phenomena.

Scientific description in its completeness, however, does not exhaust the content of intuition. No object or moment of experience in its fulness is ever the subject-matter of reflection. Each object, it may be said, is a point on the pathway of every science. Its complete description is to be found only in the combined product of all specialized inquiry. Yet even this summation cannot give to any phenomenon the fulness of intuition. Science achieves no rounded picture of reality. Its product is a set of laws which express the object's relations and modes of action as viewed from a series of selected standpoints. In this sense only can the account be called systematic or complete. Thus conceived—as a member of a specific class, as a link in a linear series, as a typical process—science gives an exhaustive account of the phenomenon and indicates the reaction to be expected from it under such conditions as are definable and quantifiable.

To effect its purpose, science must, therefore, ignore the manifold aspects which each object presents, and confine itself to a single selected point of view. One cannot aim at truth generally, or the shot misses. One conception, one relation, one test, is all that the mind may occupy itself with at any given moment. In other words, the specific assumptions of some individual science must be represented in the approach to any subject of study; a single problem within that general field must be formulated, while all cognate or derivative questions are put aside; and finally an explanatory conception must be formed and verified by the application of a rigid test.

At every instant, the greater part of the questions which an inquiry prompts must be left unsolved. The course of each investigation is cut through a thicket of problems suggested by its progressive development.

Its conclusion, likewise, while taking the form of an explanatory hypothesis, raises at once the problem of its relation to the whole series of laws in which adjacent groups of facts are expressed. Looking back, the new conception is an explanation; looking forward, it is a problem. For each solution attained, a multiplicity of questions arises; and the field of scientific inquiry is enlarged with each addition to the system of knowledge. It is only by ignoring a multitude of questions which continually spring up in the mind—more profusely the more adequately that mind is prepared for its task—and by confining attention to each single point in succession that a concrete science can be built up.

The conception of any phenomenon in terms of a single determinant, as viewed from one selected standpoint, we call abstraction or analysis. The real object is indefinitely complex; but, for the scientific imagination, only one feature of this manifold exists at any moment. The same reaction of intelligence, abstracting and isolating a single aspect of the object, appears in every process of conception whether its purpose be logical or practical or aesthetic. These various provinces of activity are to be discriminated by their characteristic systems of dominant canons rather than by any radical difference in their modes of approach to reality.

Science applies to its object a series of logical concepts, by which it is enabled to bring its data into intelligible relations and to formulate their connections in terms of general law. These laws are the uniformities of coexistence and sequence which the world presents. They express the reduction of the phenomena to certain constant types embodied in each object and event. To have conceived the object in this way is to have classified and explained it; in a word, to have taken it out of the logical isolation in which it is originally presented in experience and to have made it part of an intelligible system which can be conceived through the application of general concepts. Whether the problem be to dissect the inner structure of an object and reveal its constitution in terms of a synthetic principle, to assign the individual to its proper place in a classificatory system, or to determine the connections of an event in a causal series, the process is ultimately one and the same. To describe, one must devise a common measure or invent a denominator in terms of which the series of individuals may be stated. Similars alone may be added and compounded, or treated in any way by science.

The primary work of reflection, then, in dealing with such a series, is to detect and isolate its common features, the logical content of which is substituted for the infinitely full object itself. By this process, the confusing multitude of properties which each object possesses is ignored, the form of the problem is simplified, and the scientist's perception of significant identities is clarified and assured. Without such simplification, the formulation of descriptive or explanatory laws, and even definition itself, would be inconceivable. The content of experience must then obstinately maintain its perplexing infinity of qualities and relations, each thing and event existing as a unique object of intuition but insusceptible to scientific treatment.

The individual object, though unique in its total combination of qualities, is still a synthesis of elements each one of which, because less complex than the object in which it inheres, is more widely distributed than the latter. In general, the simpler the character or group of characters thus abstracted, the more frequent will be its recurrence in the field of phenomena at large. The more elementary the unit with which one deals, therefore, the wider will be the type which it constitutes and the larger the system of individuals which is brought into relation by its application.

The conception of such abstract characters, upon which every rational synthesis of phenomena is based, constitutes a structural principle under which all objects possessing them may be construed and their mutual relations expressed. Upon such an equation, made possible through the establishment of a unit of valuation, all scientific procedure depends. The first general method of science may therefore be called analysis, the resolution of each complex into its elements—or, more properly, the apprehension of the complex under a specific conception which substitutes an abstract system of characters for the complex totality—and the formal description of the complex in terms of these logical elements.

The scientific value of any such analysis depends upon the approximate constancy and universality of its unit of comparison. As the range of distribution of any unit varies inversely with the complexity of its content, the ideal of science is a logically simple conception, technically called an element, that is, a unit involving but a single constitutive character. The history of scientific procedure may be described in terms of the successive resolution of more complex and therefore limited conceptions into simpler and more widely distributed constituents. Upon such a simplification, the hierarchy of species, genus, family, order, and class is based. With each reduction in the content of the unit, a wider system of facts is brought together and the rational connections among phenomena are extended.

Formally, therefore, a science may be defined as the application to any subject-matter of a single constant; and its field, as that system of phenomena within which such a unit may be applied. Thus, mathematics deals with the concept of numerical quantity, and all numerable and quantifiable phenomena fall within the limits of its treatment. Physics applies in its research the constant of mass in motion; and it is the adoption of this regulative concept which makes physics, in all its manifold branches, a science. Wherever an independent body of knowledge is found, its existence depends upon the presence of such a fundamental principle, which gives consistency to its results as well as definition to its aim. Wherever, on the contrary, the limits of science are obscure or difficulty is found in defining its special objects and technical methods, it may safely be assumed that the defect arises from a confusion in this fundamental matter. Conflicting assumptions in some form have entered into the work, whether data, methods, or objects be chiefly affected thereby. As a result, neither is there agreement as to the mode in which problems are to be approached nor can its conclusions be united in a consistent body of truth.

The integration which each science prosecutes in its own field must be repeated in connection with the general system of data with which science at large deals. As individual facts are brought into relation through the possession of identical constitutive elements, so are systems of facts and laws to be unified only through the determination of elements common to the several fields in question, in terms of which each series of facts may be expressed. An equation of values in the various fields is thus mediated; and the independent results brought together by these special sciences are illuminated by a single principle of synthesis.

The nature and limits of its unifying conceptions define the status of scientific thought at any given time. If any two fields exist in which no common unit has been discovered, the work of science is incomplete. An element of irrationality persists in the world in so far as we have failed to reduce all its phenomena to common terms; for we have in so far fallen short of conceiving it as a single rational system. In what conceptions the final constants of science are to be found, it is not for the logic of reflection to establish; they must be empirically determined. If they be found, for example, in the norms of mathematics and physics rather than in those of psychology or architecture, it is not because the metaphysical basis of reality is to be conceived in Pythagorean or numerical terms, but is due simply to the fact that the one order of concepts finds a wider application than the other within the field of phenomena. It is not because we conceive life and mind to be functions of matter, or ontologically dependent upon it, that their principles of organization are made subordinate to conceptions which obtain within the physical sciences. It is merely a reflection of the fact that the conceptions which they employ are more highly specialized than those of mathematics and physics.

It is thus a logical necessity that science should attempt to restate the complex in terms of the simple, to resolve the substance into its constituents and to substitute more and more elementary units so long as inner complexity exists and a problem of structure is presented. It is this ideal which prompts an interpretation of the phenomena of human association in psychological terms, as a product of the interaction of individual minds and their complexes of habits. It is for the sake of this unification that we restate the forms and conditions of mental activity in terms of its physiological correlate. It is this principle which leads us to resolve the processes of life into forms of chemical change, and to formulate chemical reactions in terms of the motions of physical molecules whose relations are finally statable in mathematical equations.

In logical succession, one thus passes from laws in which the products of human civilization are expressed through the system of mental stimuli and reactions, the conditions of nervous processes, the nature of chemical synthesis, and the laws of molecular physics, to those universal mathematical formulae in which finally each of these classes may theoretically be stated. The procedure is uniform throughout. It is the resolution of more complex and variable phenomena in terms of simpler and more constant units. The general trend of science toward the form of abstract mechanics and its persistent search for quantitative units is due to the fact that in the mathematical field alone are to be found conceptions which enable us to attempt the reduction of the whole field of experience to a consistent and unitary system.

The second aspect of science is synthesis, the unification of its data in terms of an organizing principle. The resolution of a complex into its elements is of instrumental, not final, significance. It is the necessary preliminary to that reconstruction at which the whole process is directed. Without analysis, only the concrete complexes of immediate experience would exist, having a value as constituents of intuition but indescribable and unutilizable—such intuitions as the child must have at the outset of life before rational connections are apprehended in the changes of the world. It is the will to create these logical syntheses of experience which prompts the analysis of phenomena; and it is the service which analysis renders in these ideal reconstructions that gives it value. To create the forms of entity, class, and law, and to describe experience in terms of these general concepts, is the work of science.

The unities at which science aims are thus radically different from those presented by immediate experience, which form the starting-point of scientific treatment. The former, in a word, are abstract; the latter are concrete. Experience begins with realities of aesthetic and practical significance which reinforce or oppose the movements of our preferences. It is concerned with desires and obstacles, with attitudes and values, with the utilization of material things and adaptation to other human selves. The treatment to which science subjects all phenomena does not affect this aspect of their existence. The practical and sentimental values of life are intrinsic and permanent. As objects of immediate worth and significance, science enables us to understand them, not to dispense with them. Of any given thing, it offers a systematic description; but that account cannot be made, in any sane world, to take the place of the object described. What science achieves is a regulative formula applicable to phenomena, which, in the end, is nothing more than a comment upon the form of their existence.

Both functions of science—analysis and synthesis—thus result in the production of abstractions. The element which the former provides and the unities to which the latter leads alike constitute logical conceptions, not intuitions of reality. Substance and attribute, essence and accident, molecule, atom, and element—and just as fully, type and class, relation and law, cause and condition—are abstractions which the intelligence finds necessary to its own reflective procedure. They are instruments of the mind in reducing the materials of experience to order and creating a cosmos out of elements given as a logical chaos. Each of these conceptions is as necessary to experience as the individual quality of the moment itself; but the two classes have different forms of existence. The latter is the ultimate object which vitalizes experience, giving it body and flavor. Life dies in the rare atmosphere of logical abstractions. Apart from the sum of individuals whose relations they serve to make intelligible, the syntheses of science are bare potentialities. The type, for example, is but a synthetic form by which these individuals, though unique, are nevertheless held together in the mind.

Every science is a system of such abstractions. Each law is a formulation of specific relations obtaining among the phenomena to which it applies. The resultant is neither an individual among individuals, nor an occurrence, nor a relation between objects or events. It is an expression of the permanent characteristics or uniform connections which the mind has discovered. Such a law can be found only by abstraction from the whole group of individuals or series of events to which it applies. If the relation existing at any moment be an abstraction, the law expressing a constant relation is an abstraction of the second order; it is the unity of a series of abstractions. The system of laws in which science expresses itself is a gossamer network whose invisible threads—seen only by the eye of the mind—have been thrown out to all parts of the world and now unite them into a single system. In their totality these insubstantial fabrics of the mind constitute the basis of intelligibility in the world. They are the logical forms in which reality is cast.

But it is to be noted that the idea of an object, like that of an element, is a reconstruction of the material of intuition formulated in the service of the rationalizing mind. It isolates and renders permanent certain conceptual aspects of experience in order that their meaning may be preserved and action made possible. The notion of a world of objects does not imply belief in a system of unchanging phenomena. Each thing, as the mind conceives it, is the result of a process in which the flow of experience is ideally arrested and the object of attention fixed as a conceptually independent reality. It is to denote these realities that substantive terms have been invented; and language may be described as an objectification of the ideal products of attention.

On the other hand, this synthesis through which the notion of an object arises does not affect the perpetual flux of experience. That which is construed under the notion of independence and permanence in its substantial aspect exists also in historical relations as the culmination of one series of events and the origin of another in a continuous stream. Each thing is not only a system of characteristics but also a system of effects and a system of causes. But in this transitive view, just as in the substantive, one series of connections in which the object of attention appears is singled out and held before the mind to the exclusion of all others. In both cases, the unity of experience is broken, the one conception dissolving the continuity of succession, the other that of coexistence. To resolve the manifold of experience in terms of these two orders of conception is a necessary procedure of the intellect; the idea of an event, like that of an object, is an instrument of the logical understanding.

In their application, the products of this synthetic activity range from the individual objects of the sensible world to those supreme forms in which the whole external and internal orders find unity, in the concepts of self and world. Even beyond these limits, however, the rationalizing process is extended. In those supplementations of experience at which speculation and faith aim, there is asserted, on the one hand, a logical unity in the universe of reality, and, on the other, a moral consistency in the doctrine of compensation.

These unities, which intelligence finds indispensable in the prosecution of its function, are thus abstract ideal forms. No juggling with them will ever create a single element of that world of intuitions in which we are continuously immersed. Both their nature and their purpose are misconceived when we imagine another world created by science out of these conceptions, a world more permanent, or more real, or more rational than that of immediate experience. Science is engaged in the construction of no such chimera. It offers but an illuminating comment upon that sole existent world which is originally given in our intuition of reality. Its atoms and forces and laws are not offered as substitutes for the things, events, and relations of real life. They are concepts by which the description of these realities is mediated. One should not, therefore, ask: Does the reconstruction of the scientist give a faithful picture of the thing? but say: Does the system of laws which he formulates hold true of that reality?

These conceptual relations and identities give to the content of intuition that intellectual form which it must take on to be experience at all. When the term "intuition" is not used for reality in its immediacy, but means a sympathetic penetration of objective existence in some particular, it can no longer carry with it the notion of a blind reaffirmation of experience. If such intuition exist, it will be manifested solely in a practical identification with the object, a participation in its moods or reactions. It will not appear as an imaginative rapport which is achieved only through a process of reflective objectification. It is of course intuition in the latter sense alone which can be offered as an alternative mode of understanding the world when the approach which science makes is condemned as inadequate. But such a reaction stands at the opposite extreme to intuition as immediacy. It is the funded product of facilitation in all those activities of apprehension which depend upon analysis and have an articulate form of expression as their vehicle.

Abstractions, or ideal forms, are not only involved in the work which science undertakes but penetrate all the reactions of intelligence and are fundamental to the form of experience itself. To reduce phenomena to their elements and to express the combination of these elements in terms of law is the general task of reflection. It seeks to discern the identities which lie embedded in experience and to describe them through the use of constants. Its work may therefore be defined as the application of ideas to experience, since it seeks the formulation of its content in conceptual terms and establishes the experiential basis of all our ideals. Stripped of the form which reason gives, nothing would be left but a blind flux, without distinction or meaning; while, unregulated by systematic reference to the specific data of experience, our ideas would be a vain dream. The succession of impressions is illuminated and given systematic order by a process of ideal reconstruction; and the cloud of our ideas is restrained and made rational by the test of incessant application to the facts.

In its most abstract and speculative flights as well as in its immediate and practical concerns, the activity of reason aims at nothing more than this alliance between brute fact and ideal form. The most elementary reaction of intelligence, to have any significance or value, must already exhibit the function of abstraction; and, in its most general formulations, reason must retain specific concrete reference if its concepts are to have meaning or use in our life.

Therefore we must not deny either immediacy, because it cannot be formulated, or intelligibility because it cannot be presented in an intuition. The rationalistic temperament inclines to the one absurdity, the mystical empiricist to the other; but in neither case is reality clearly envisaged or faithfully represented. For we cannot so immerse ourselves in the flux of immediacy as to dissolve those forms of apperceptive reaction upon which the very existence of the world of experience depends. Nor can we so far withdraw activity from the qualitative manifold as to maintain ourselves upon a bare system of intellectual schemata. To be real for intelligence, the materials of experience must have form. The products of its syntheses are found in the most elementary of sensuous intuitions; and the relations with which reason concerns itself must have terms in the manifold datum which is immediately given. Distinctionless flux and pure intelligible form are alike abstractions from the fact presented by experience, in which they equally inhere.

# CHAPTER IV

# THE APPROACH TO EMPIRICAL TRUTH

THE conceptualizing activity of intelligence gives to experience an intelligible form, and provides the ground of all rational conduct by creating a system of values in terms of which the materials of intuition are moulded and appraised. This activity is expressed in two ways, plastic and reflective. In the first, materials are recast in forms which embody the ideal aims and values of consciousness. The result is a system of utility in practical inventions, of beauty in the products of the fine arts, and of moral worth in individual human character. In the second, or reflective, activity of reason, the formal conditions of experience at large and its empirical connections are formulated as a rational system of concepts. In the one case, reason is embodied in action; in the other, it is expressed in a system of knowledge.

The latter reaction of intelligence is logically prior: an understanding of the nature of any material is the basis of its utilization. But, in their historical development, the relation of these factors has been characteristically reversed. The practical art has arisen before the science in which it is grounded has been reflectively formulated. As the theoretical basis of action is extended and consolidated through experimental investigation, this relation is modified: the possibility of new arts, instead of being developed through a blind empiricism, is derived from the theorems of pure science. Thus the application of rational method to experience at large not only presents a variety of embodiments, but is also the result of a slow development which finds expression in individual mental genesis as well as in the general evolution of intelligence in human culture. In analyzing this activity, therefore, it is first to be discriminated from certain other reactions of intelligence which, though they may have practical and not merely sentimental values, are inadmissible in the field of empirical research.

The nature of knowledge, as well as the approach to its problems, has been variously conceived. The immediate qualitative consciousness which a stimulus arouses, for example, may be included within the term. This experiential contact, in which the unique flavor of individuality is received in the direct shock of intuition, is the starting-point of all subsequent thought concerning the world. In itself, such acquaintance implies no specific degree of knowledge about the connections and causes of things. Nevertheless out of such repeated experiences with certain classes of materials—as already pointed out—habitually arises knowledge of a higher order which is expressed in adaptive reaction to the stimuli they afford. One does the right thing; one makes the correct selections, handles materials with skill, or gives them proper classification in practical relations. But one does so in a direct intuitional way and commonly without an articulate consciousness of the grounds of decision. This fusion of knowledge with action is the characteristic mark of art.

In the field of purely subjective consciousness, a similar intimate fusion of the activity of knowledge with its object has been sought, which, like that of art, must be contrasted with the reflective procedure upon which intelligence depends in empirical and logical fields alike. This may be called the inspirational conception of the approach to truth. It asserts the possibility of an immediate identification with the object of knowledge, and may therefore be described as an intellectual intuition, since it extends to a new field that experiential contact which makes sense-intuition the root of all reality.

This mystical access to knowledge is not to be conceived as a pure expression of the will to know, for it is grounded in the aspiration after happiness or perfection. But in its greatest historical manifestation—in mediaeval mysticism—it opposes to the discursive activity of reason, upon which Scholasticism grounded its conclusions, a new and characteristic method of attaining knowledge, the object of which possessed for both philosophies a transcendent character. That mystical contemplation was inseparable from spiritual discipline, in asserting that religion is a life, not a dogma, to be expressed in faith and spiritual communion rather than dialectic and mythopoea, and that God is the end of aspiration as well as the object of knowledge—all this is, in this regard, a secondary matter. As a method, it postulated an immediate penetration of its object, as opposed to those mediate processes upon which logical or scientific proof depends.

The mystic approaches reality by deepening and universalizing experience, in its aspect of subjective immediacy, until the world within and the world beyond fuse in a single significant unity of being. It exalts the individual consciousness until the distinction between subject and object is dissolved and the soul becomes one with that which it contemplates. For the mystic, this introspective deepening of consciousness is a metaphysical procedure as well as a religious experience. To know God is to become one with him.

The method of establishing this relation with reality is by what may be called an act of will as opposed to an activity of the intelligence. The obstacles to its attainment are not ignorance or deficiency in intellectual training. They are lack of faith and blindness of the spirit, inner difficulties which the will may sweep away by a single motion. The preparation which an attainment of this object necessitates is, in psychological terms, the emptying of the mind of all discursive activity and positive direction, the assumption of a purely receptive, yet expectant attitude which allows the divine spirit to enter and possess it—to inspire it.

This mystical attitude is not merely a phase in the historical development of culture; it is a persistent mental habit which is often carried over from the field of religion to that of empirical relations, where it comes into conflict with the methods and conceptions of science. In the matter of practical acquaintance with objects and their control, similarly, dependence is sometimes placed upon a certain inexplicable intuition of quality or significance as a substitute for specific observation of character. These reactions, it has been pointed out, have their place in life and even in judgment. Habituation should give rise to facilitated responses of this kind both in the handling of physical materials and in adaptation to the attitudes of other human wills. The animus of a crowd spreads to its later additions by a species of psychic contagion, and the mutual understanding of those who have been long associated is grounded in an immediate sympathetic penetration of mood rather than in reflective thought.

But all such intuitive understanding and adaptation must be opposed to the very nature of reflection as a method of approaching intellectual problems, even in the sphere where it has a legitimate development. When pushed beyond the range of individual personal contact in practical experience, and made the basis of general deductions, it becomes either a mental vice or the pose of a charlatan. This reaction takes many forms. Here an inexplicable presentiment of truth is grounded in physiological reactions. There an intuition of personal character is received through contact with a single article of property. A people's essential artistic genius is discerned in the expressive act of an individual, or the significance of human history is seized through listening to a piece of music. Now this sending of one's soul into the invisible may have the immediate value of all mystical experience to its subject, or it may be a miraculous revelation of truth; but, for the scientist, it has no meaning or interest, except in so far as it may be construed by the psychologist as a datum like any other fact of individual experience.

The nature of the materials with which psychology deals makes it especially necessary to guard against this intuitive mode of reaction; for it is just the attitudes and expressions of other human beings which we are accustomed to discern and respond to in this way. The psychologist is, therefore, beset by a temptation which does not exist in the domain of physics and scarcely invades the biological sciences, namely to substitute a sense of the worth or significance of any mental reaction for an inquiry into its constitution and historical conditions.

It is, of course, true that while, as a matter of fact, intuition may go very far astray in the character it thus attributes to persons or events, this habit of projecting the ideal values of consciousness into the world is fundamental to experience. Whatever their epistemological status, these intuitions of reality are the great moving forces of human life, whether we call them illusions or creative ideals. But they are postulates, not theorems; they are beliefs from which actions are to spring, not conceptions to be verified or developed. However useful they may be to reaction or indispensable to the interpretation of experience, they afford no assistance to reflection—as referring all things to God, in another relation, is futile as a principle of explanation. Reflection can rest neither in the shock of unique impressions nor in that mystical rapport with the world which appears in a fused intuition of the values or significance of experience. It is essentially an articulate proceeding in which the object dealt with is conceived in terms of its elements or referred to its conditions in a specific conscious act.

As an intellectual habit, the empirical attitude of mind is a characteristic of the modern spirit. It differs from that which it displaced in both aim and method. As to aim, the natural world is substituted for the supernatural as the object of knowledge. Interest turns to the content of experience, to nature and man, as the field of immediate concern; and there arise as its product first the physical and biological sciences, but later the psychological and social as well. As to its method, knowledge is conceived as an acquaintance with natural phenomena and natural law. It roots in reason and is a progressive achievement of human intelligence.

This attitude is not peculiar to the natural sciences; it is characteristic of the modern spirit in all its activities. As a regulative point of view, it may be described as the conception of immanence in contrast with the transcendental habit of the Middle Ages. For the latter, interest lies in a future life. The object of knowledge is God or his providence, and its source revelation. The relation of God to the world is that of Creator or First Cause. Moral judgment is grounded in authority, and its sanctions are external. Political sovereignty is absolute and based on divine right. All these fields intelligence conceives in transcendental terms. The object or cause, the value, the authority, are represented as lying beyond the system which their postulation affects.

In its reaction against this point of view, the modern spirit transforms all these relations. God is the ground of existence, not its first cause. Nature is a system of resident forces to be treated in terms of descriptive law; and knowledge is the reaction of natural intelligence upon the content of experience. This reversal of attitude affects practical and moral relations as intimately as theoretical. The soul's immediate concern is with the present not the future, as regards both understanding and utilization. This reconstruction is embodied in the humanistic movement and the secularization of art with which the modern period began—in a study of pure beauty in the plastic arts, of emotion in poetry and romance, and of the record of human achievement in classic literature and history.

Religion, likewise, becomes natural and experiential; neither institution nor intermediacy is essential to its existence. The conception of morality ceases to be ceremonial. Its sanction is a purely inner obligation, and its ground a system of resident values. In the modern state, authority is no longer vested in autocracy or referred to a supernatural origin. Institutions are created as a means to self-realization; and law derives value only from the service it renders to social life. Finally, under this conception, philosophy is modified in both method and limits. It ceases to be dogmatic and becomes critical, recognizing its origin in reflection and its ground in experience. Its general point of view and criteria are thus prescribed; for, whether it becomes positivistic or not, it remains essentially an interpretation of experience which can have value only in so far as it continues faithful to the intimate facts of life and is able to give a coherent form to the values of experience.

In the transcendental-mystic habit of mind, man ceases to investigate, and his intellectual life becomes either a perpetual contemplation of God or a casuistic defence of his revelation. The whole vision of the world is polarized; and nature appears as a vast divine allegory. For the modern or naturalistic-empirical habit of mind, the values of existence are intrinsic, and its aim is the free and full exploitation of their significance from the side of knowledge and of utilization alike. Out of this impulse has come not only the whole development of modern science and its practical applications but also the introspective study of nature and human life in the service of music, literature, and the fine arts.

The most general manifestation of this attitude is that interest in experience as such which appears in a love of the sensational as truly as in the desire for knowledge. It is an experimental attitude toward life and the world which seeks to understand, to experience, and to utilize all that these things can be made to afford. The range of possible sensation is explored, and the system of objective stimuli is enriched in every way to secure the fullest reverberation of consciousness. Human roving in vagrant and explorer alike, is a manifestation of this spirit, which passes by insensible gradations into the more purely intellectual curiosity of the scientist. It carries travellers in swarms to the remotest corners of the earth and leaves no mountain unscaled, no desert uncrossed, while the natural features, inhabitants, and products of every country are subjected to a many-sided scrutiny and recorded in a multitude of publications.

The technical investigations of physical and historical science spring from the same root, and may be described as a logical systematization of this exploring activity. In geology, it has probed the earth as it has penetrated space in astronomy; for Kepler, Galileo, Copernicus, and Newton are brothers, in a larger mould, of Drake, Frobisher, Magellan, Da Gama, and Columbus. In time and in space, toward the infinitely great and the infinitesimal, our view of the world has been extended; but it is the range of vision only, not the point of view, which has been affected.

The same spirit appears in the treatment of the human body and its adaptation to the conditions of life, where it has given rise to experimentation in diet, exercise, and medical treatment, as well as to a sustained endeavor to develop its full possibilities aesthetically through gymnastics and practically in the cultivation of every form of expertness. In relation to objective materials, this interest is reflected in the systematic study of mineral, agricultural, and animal production, in the development of mechanical and industrial invention, and in the technological study of trade and the applied arts.

This spirit is not represented in the development of experimental investigation and exploitation of the earth's resources alone. It is the vitalizing principle of modern intelligence in all its applications. The dominant note of contemporary art, no less than of science, has been the experimental development of its qualitative materials through the most exact and penetrating analysis. The lyric artist has explored the depth and range of human emotion in order to discern and express every modulation of its force or quality. The dramatist and novelist have sought to dissect the complex structure of human character and exhibit the secret or unavowed motives of action in all their subtle interplay. Not only in literature but in music, painting, and the fine arts generally has this enrichment of content through persistent experimentation been a fundamental motive. The exploration of human nature and of the means of expression undertaken with this object has had an effect of the first magnitude upon both the subject-matter and the technique of art.

This spirit of inquiry, which we prize as the peculiar characteristic of modernism, has touched all nature and all mind. It is the very spirit of intelligence itself in its most elementary and pungent reaction, the spirit which steeps itself in its subject-matter, recognizes no taboos, and dares all to know all. The sharply individualistic note of modern philosophy is its expression in the field of pure reflection; and the will to determine for ourselves the grounds of belief and action is its manifestation in that of practical activity.

But this eagerness for new experience is merely the starting-point of inquiry. It is the experimental attitude in its most rudimentary form. Alertness of mind and an instinct for exploration provide only the occasions and stimuli of investigation. The variety of the world and our own complex natures afford an exhaustless field of novel stimulation which may either be cultivated for the intrinsic sensations it provides or examined in order to discover their conditions and effects. But we are not concerned here with the connoisseur and sentimentalist. It is the reflective activity of intelligence in reducing to order the content of experience which is to be considered, and the problems encountered in the execution of its programme.

The nature of each intellectual problem determines the mind's mode of dealing with it. Viewpoint and form of procedure vary with every change in the specific character of the subject-matter. The working out of a system of technical regulations which shall guide the student in his investigations is thus part of the task of each special science. But, in addition to these particular problems, there is a general problem of method as applied to the study of phenomena at large. These points of view and regulative concepts, in which all sciences alike share, must be considered in any critical review; for the procedure of knowledge is determined by its general assumptions as well as by its particular aims.

By knowledge, we mean a system of concepts having objective reference and validity. Of such reference, there are two general types, the formal and the material, of which the logical and the empirical sciences are respective representatives. Each of these groups has its own characteristic and unique principles of method. The concepts to be discussed here are therefore not applicable to knowledge universally considered, but only to knowledge of fact—in other words, to the group of natural or descriptive sciences. Within the field of mathematical and logical science, that is, within the limits of those forms of knowledge which in general are called a priori, it does not apply.

In the latter case, it is not a series of empirical concepts which is in process of elaboration, but a system whose individual characteristics and general relations are determined by considerations of inner consistency. Each theorem is validated by reference to the formal group into which it enters. None is objectively conditioned in the sense of being contingent for its demonstration upon the appearance of certain facts in the empirical series of experience. Its verification lies wholly within the system of concepts to which it belongs, and represents the development, according to a purely logical synthesis, of the implications contained in a field of postulates. In the ideal sciences, therefore, the problem is, Given these postulates as the conditions and limitation of action, to determine what combinations can be made of the materials in question.

All such systems are independent of experience in the sense that their concepts have not been devised as a means to the description of its successions of events. Their field lies wholly within the limits of the logical consciousness. While, therefore, the validity of each concept must be tested, its reference is not to an objective system of data which it successfully integrates, but to all the related concepts developed from a common rational basis and under the application of a single system of criteria. A mathematical or other logical science thus constitutes a system of elements having purely reciprocal reference and validity.

The empirical sciences on the other hand, while aiming at a final reciprocal validity, have in addition—and primarily—a material reference as their constitutive principle. In other words, the form of their organization and development is determined by a system of objective materials revealed in individual concrete experiences.

As already pointed out, this system of facts, presented in relations of coexistence and sequence, appears primitively as material plastic or resistant to the creative activities of the self. But, in order that it may serve in the realization of those ends which a rational life represents, this material must be interpreted in terms of general principles. The concepts which we form in the development of the natural sciences, being grounded in this system of materials, are wholly determined by the character of the facts to be described. To this demand, the inner consistency of the whole system of concepts is secondary. That such harmony shall ultimately be attained is indeed the ideal of all science. In the end, the whole series of concepts must form a unitary system, as they do in the pure or a priori sciences. But while, in the latter case, the starting-point is a group of fundamental theorems from which the system of concepts is continuously developed, in the natural sciences the starting-points are many, and unification within the general field takes place through progressive adjustment and reconstruction.

In the natural sciences, classificatory concepts and explanatory hypotheses are essentially subject to modification, while, in the field of logical reflection, progress characteristically takes place through an enlarged conception of the field of their synthetic development. In the natural sciences, therefore, every new generalization means a reconstruction of previous hypotheses; in the a priori sciences, the later synthesis is developed out of those which preceded it. In the one case, growth takes place by continuous extension from a single centre; in the other, it springs up in many circles whose edges finally come into contact.

This contrast, on the other hand, must not be made too sharp. For, in the mathematical sciences, the formulation of a new conception in one field may lead to revolutionary progress in another through the novel meaning which is thus given to fundamental conceptions, or the extension in their range which is made possible. The characteristic methods of one branch of the science may thus find an unexpected application in the development of another, resulting in an organization of their subject-matter similar to that which occurs in the empirical sciences when two adjacent fields are synthesized through the discovery of more general laws.

This difference in point of view and method we mark by the terms deductive and inductive respectively. The natural sciences start from the individual fact and seek, first, to establish its relations in the adjacent field; then, by a series of transitions, to formulate the connections which obtain within larger and larger groups of facts. The logical sciences start from the general principle, and develop the forms which it necessarily takes in a given field of relations. From the outset, therefore, logical science is a unity and undergoes evolution only as to the manifoldness of its content. Natural science, on the other hand, begins with a manifold content, and is supported only by the presupposition of a unity to be finally attained when the work in which it is engaged shall have been completed. Subjective consistency is the criterion of truth within the one group, objective conformity within the other.

Fidelity to the facts of experience is thus the first requirement in the field of natural science. Further, a single general assumption underlies its procedure, namely, that the data can be organized in a unitary system. When, therefore, conflict appears within the system of concepts, when explanation in one field contradicts that in another, we say that there must be something wrong. The two conflicting theories cannot both be true; in one or other the facts must be misconceived.

To remedy this defect and make the related concepts harmonious, there is but one possible recourse, namely a return to the phenomena themselves for further study. In various instances, the history of science, like that of practical invention, has presented what may be called points of arrest—the exploration of a given field having apparently reached completion, so that no further advance was possible. Under these circumstances, a new forward movement has repeatedly been initiated through the discovery, within its limits, of ranges or aspects of fact hitherto unsuspected. This was true, for example, in regard to the determination of the germ-basis of disease. Every such field presents classes of phenomena which are neglected because their significance has not been seized, and others which escape observation altogether because means for their detection are lacking. The invention of new instruments of precision, the substitution of a novel angle of mental vision, often suffices to bring to light facts which revolutionize existing conceptions and lead to a permanent extension of knowledge.

It cannot be too strongly insisted that the scientific scrutiny of fact never terminates; that, at no status of discovery, can it be held that the possibility of novelty in any thing is exhausted. The tissue of phenomena in everyday experience—in things and thought alike—is a fabric of complex texture which endlessly reveals novel features under the light of new conceptions. Psychology has profited a thousand times through such reinspection; and it is a salutary experience for any science, when the ebb of exploration or difficulty in organization has sent it back to the facts, to undertake again the patient examination of data many times explored but still understood only in part.

In this attempt to gain an exact and impartial view of phenomena, the investigator encounters not only the obstacles imposed by initial ignorance and the difficulties of observation, but also certain impediments which root in the constitution of his own mind and its selective activity. The scientist sets before himself the ideal of an impartial account of the external world. His work must be freed from personal prejudice of every kind. Elements of sentimental valuation have no place in the world of scientific truth; except, indeed, as themselves matters for investigation and record like all other phenomena. To suppress facts because they are at variance with an already accepted theory, or to warp them in the direction of a desired interpretation, contradicts the very assumptions of science; for its aim is to transcend the limitations of individual experience and to establish principles which are independent of subjective bias and form a body of truth common to all observers.

Deliberate distortion of fact the scientist does not discuss. Sincerity of purpose in the observer, together with honesty and reliability in the record, are presupposed in so far as these results are dependent upon the intention of the investigator. Honesty of purpose, however, is but the starting-point of accuracy in the record; and the advance of science has involved, at every stage of its progress, a renewed criticism of the conditions of observation, and an investigation of the possible sources of error to which its methods are liable.

The personal or psychological factors of distortion which thus appear in the report of an external event may be grouped into two classes, physical and mental. The first of these embraces all the external conditions of observation, including the mechanisms of perception. The second consists of the various sources of unconscious bias which inhere in the intellectual processes of the observer. The former are often relatively stable, and, in general, are functions of measurable variations in the conditions of experimentation. They are of comparatively easy correction, and the computation of their values is always incidental to the presentation of results. Such are the correction for time and space differences, the establishment of the observer's personal equation, the allowance for variations in nutritional and other physiological modifications, and the like.

Errors of the second class are of a different nature. Their character is peculiarly personal and their range unpredictable. While the existence of such subjective bias in any given case may be assumed, its direction and amount are determinable in but the most general way from an acquaintance with the mental habits of the observer. Even this correction can be applied only to certain large features of a man's work, such as his philosophical interpretation of scientific data. In a multitude of cases, it is wholly impossible to estimate the allowance which should thus be made in an individual report, or even to guess at the nature of the factors which are operative in the process of subjective distortion.

To give a literally unprejudiced account of any matter of fact is of course a practical impossibility. Each event takes shape within individual consciousness in dependence upon the dominant system of values or modes of organization which that mind possesses. The variations in the reports given by any person and his fellows will be proportional to the differences in interests and habits which exist between them. These variations need not present discrepancies—though they commonly extend even to contradictions—but may involve only changes in proportion and emphasis.

It is obvious that the violence of external stimulation alone does not determine the intensity or permanence of the impression which is made upon consciousness in any given case. The general habit of attending to such impressions, and the openness of the mind at the moment, are more important factors than the absolute magnitude of the stimulus. In other words, selective attention working under the guidance of our organic interests operates upon the materials of intuition, adding accentuation and emphasis, seizing upon and preserving certain elements which we call pleasing or important, and relegating the rest to obscurity or oblivion. The existence of subjective bias is thus not an incidental error in our observations but fundamental to the very character of the human mind. We can conceive of its elimination only in an absolutely dispassionate consciousness devoid of feeling and purpose.

This universal bias roots in the fact that at each moment of our experience some one interest is for the time being paramount, and determines both the objects which shall be attended to and the interpretation which they shall receive. The nature of any reality with which the mind concerns itself, whether objective or subjective, is affected by changes in this system of inner relations as the appearance of a physical object is modified by being overturned and regarded from a new point of view. One may identify the object with that of the moment preceding; but, at best, it is the same with a difference. A new set of angles appears, and its relations with other things have changed. The reaction within the mind has given the object a fresh meaning through the introduction of a novel system of emphases, and its character as a mental object has thereby been transformed.

The very hold which any impression or idea possesses depends upon its relation to the dominant system of reaction-motifs which expresses the temporary or permanent disposition of the mind. It must in some way fit the purpose of the moment or appeal to an organic habit if it is to take intelligible shape before consciousness. While reading a book, for instance, one disregards wholly the width of the margins, the smoothness, rigidity, and rectangularity of the covers, and the weight of the volume; but any of these might, on another occasion, become essential to reflection if one were in search, say, of a paper-weight, a straight-edge, a writing-pad, or wished to make marginal comments upon the contents. The perception of symmetry in visual forms, again, expresses the fact that the mind wills to attend only to those lines and masses which present geometrical balance; for, in every such design, the possibilities of unsymmetrical construction are incomparably more manifold than those of the regular systems upon which the eye dwells. The apprehension of the latter, therefore, depends upon an ignoring of all that is formless or disproportionate, which can be referred only to the organic disposition of the perceiving mind itself.

This subjective selection and emphasis pervades all mental activities, perceptive, imaginative, and rationalizing. It is expressed alike in the construction of that orderly world of objects and space-relations to which our senses give rise, and in the determination of ideal association in our purposeful thinking. But, this universal aspect of human consciousness once acknowledged, we are no longer concerned with its existence. It is as proper to point out that it is the basis of intelligibility in the world as to recognize that the apprehension of that world varies from moment to moment in dependence of transitions in the point on view and present purpose of the beholder.

It is only when a bias of the second order appears that its detection assumes practical importance, when our types of confessedly selective perception and representative thought are distorted by factors of whose presence we are unaware at the moment of judgment. Such are the familiar space and time errors of which account must be taken by the psychologist in reducing observations involving position and movement, or comparisons of events in serial order. Such are also the sources of unconscious prejudice which influence personal opinion of men and events.

The interest of the psychological student in these phenomena does not concern the mere fact of their existence. The presence of such modifying influences may be presupposed in all cases; they are as pervasive as gravitation. The judgment made at any given moment reflects, in a way, the whole system of stimulations—inner as well as outer—which is operative in determining the cast of mind at the moment. One's judgment of the comparative intensity of a sound, for instance, depends upon both the character of the auditory impressions which have just preceded it and the whole system of stimuli acting upon the senses at the moment, as well as upon the physiological activity of the body and the direction of attention on the part of the subject.

The same holds true of all judgments concerning the qualities and relations of objects in the world about us. Part of the work of any psychological observer is of course to determine, for all important modifying influences of this kind, the typical curves of value which they manifest in connection with a series of systematic variations in their concomitants. The investigations of color-contrast, of heterosensorial reinforcement, of the influence of distraction upon judgment, are cases in point.

One approaches a more obscure and difficult problem in passing from investigations of sense perception and memory to judgments based upon conceptual processes, or comparisons of objects so complex that many significant relations exist between them and the mind which judges. Especially is this the case with all humanly real objects, which are reacted upon naturally and seriously because they enter into relation with the practical business of life. In the latter case, every significant point of view from which the object has ever been regarded becomes a possible source of secondary bias; its practical, political, aesthetic, historical, or religious value may each and all affect one's judgment of even its immediate physical character.

We exaggerate the size of our gods and heroes, making them "larger than human" not only because the conception of bodily prowess so frequently lies back of the thought, but also because the estimation in which we hold their political or moral significance tends to be reflected in our representation of their bodily appearance. The important and familiar places of the world are located by each person at points nearer to himself, and places historically obscure at points more distant, than their actual geographical positions. The influence of all violent passion upon perception of fact, and the *argumentum ad hominem,* exemplify the same interpenetration of values.

All these interferences with impartial observation must be taken into account as a preliminary to the critical treatment of scientific data. The special form taken by such subjective bias varies from science to science and is affected by the methods employed. In each case, specific measures must be taken for their elimination or cancellation; but the working out of this technique is not part of the general consideration of scientific method.

There is a second aspect to the problem raised by the mind's reaction to empirical data, namely, the conditions of validity in scientific evidence and the characteristic errors to which reflection is exposed in the formulation or testing of explanatory hypotheses. Among the most elementary vices in this field is hasty generalization. From one instance or a few, the observer leaps to an assertion concerning a whole class of cases.

This discontinuity between data and conclusion occurs under two typical conditions. In the first place, it arises in connection with observations deeply colored by emotion. Facts which are striking and impressive, actions that have aroused our passionate admiration or aversion, consequences which we ardently desire or dread, are universalized on insufficient grounds. The most unquestionable evidence may be inadequate to displace a belief thus set up. In the second place, this type of error is characteristic of deficient training and ignorance of the special domain of experience with which it is concerned. Hasty generalizations are most commonly made in regard to things which lie beyond the limits of our own professional activities. The physicist has an impregnable theory of literary technique; and the janitor is a dogmatist in theology. Neither recognizes the complexity of the materials with which he deals or suspects the intricacy of the relations which bind them together.

In proportion as expertness is attained in any field, we grow cautious in our generalizations. A knowledge of the complex relations which obtain among phenomena makes us test each newly observed sequence in many ways before we venture to pronounce concerning it. Even when formulated, such a generalization does not predict the occurrence of an event unconditionally, but only asserts constancy in its relation to an antecedent. Scientific law, in other words, has only a theoretical universality.

Whatever practical motives for hasty generalization exist are reinforced by the mind's natural impatience at suspense. To be able to classify or explain brings an immediate satisfaction, irrespective of validity in the result. For, though the explanation of our irritation at failing to solve a theoretical problem is ultimately to be sought in the obstacle it presents to effective action, the immediate stimulus which provokes a decision in such cases is purely psychological. The state of doubt is intrinsically disagreeable; for it interferes with our subjective sense of control, and hinders free movement in the field of ideas. If, then, the penalty of false classification be not great, we are satisfied with a slight scrutiny and accept the loose generalization it provides, rather than endure the delay involved in a more exact survey.

With this is to be associated a vice to which the dabbler in research is perhaps not solely liable in his choice of working hypotheses. The very novelty of an explanatory concept may seize the imagination and, without possessing superiority, displace an older principle which has become commonplace. There are fads in science as in other activities, and the zest of applying a new conception has had something to do with the rise and decline of the many theories which have secured temporary dominance in scientific thought.

Even when empirical investigation is pursued under favorable conditions, the mind is confronted by a situation which leads to innumerable errors of inference in common belief, and may be said to constitute the general problem of inductive method for technical science. In its more elementary form, a purely accidental sequence among events is construed as a causal relation and its observation gives rise to a mythical generalization or superstition. But the conclusion may be based on a connection which is neither fortuitous nor insignificant and still be incorrect.

The connections of any event are manifold; and, until this multiplicity of circumstances has been resolved into its elements, the determination of causal relations is insecure if not impossible. The supposed cause may be in reality the correlative effect of a still undiscriminated antecedent. For example, in support of the common belief that some kinds of trees are more liable to be struck by lightning than others, it has been pointed out that an actual tally kept for years showed that, out of the total number struck within a given area, oaks were twice as numerous as firs, and that not a single beech had been injured. Now the conditions of such an inference are complex, among them being the proportion of each kind of tree to the total number, its manner of growth, whether in masses or singly, the comparative height of the various species, and the relation of their habitual exposure to the lie of hilltops and valleys. Until all such facts have been considered, no specific conclusion can be drawn.

But even when a causal connection has been experimentally established, the determination of specific relationship may be arrested by the entrance of purely incidental coefficients into experimentation. Every change introduced is complex. The variation of any one factor is accompanied by secondary changes in other elements.

The resultant which attracts attention may, therefore, be due to dependent modifications in factors which have altogether escaped observation. If two chemical substances, for instance, are combined in a fixed proportion, it seems reasonable to suppose that the resulting compound should present the same properties whatever amounts of the two proportional ingredients may be used. Yet, in certain cases, it is found that the nature of the resulting compound is very largely affected by this factor. Heat being evolved in the chemical union of the two substances, the degree of its intensity is a function of the quantities involved; and, when this rises beyond a certain point, the character of the synthesis is materially altered.

Apart from specific defects, however, the very conception of organic relationship introduces a new complication which must be considered in the formulation of hypotheses. The significance of any fact does not lie in its own intrinsic quality alone, but depends also upon the form and extent of the system in which the mind incorporates it. A related group of facts is more than the sum of its individual components. The meaning of each is reinforced by the web of relations into which it is woven, and it is in this mutual reference that the weight of evidence chiefly lies. A series of facts having no significance because its constituents have been presented in isolation, may become charged with profound meaning when their connections shoot together and they are viewed as a system of related events.

The formulation of a special classificatory or explanatory concept may therefore be said to create an intellectual bias, since facts supporting it are given an excessive value, while those which count against it are minimized in significance. When alternative methods of interpretation are in question the mind will be guided in its selection by the relation which the results of such treatment bear to the theory under review. Especially if the student be eager for its further verification, he may be led to neglect unresolved phenomena on the assumption that they will finally be found explicable in terms of the concept in question, although the form of reconciliation has not yet been apprehended. Facts in ultimate conflict with the theory and affording a starting-point for the formulation of a new explanatory concept may thus be passed by as unworthy of serious consideration.

These difficulties are indeed the gravest by which the scientific investigator is beset, and they are especially to be considered in psychology, since in that field it is particularly difficult to detect and expose fallacies of this kind. The investigator and his observers fall, so to speak, into a conspiracy to destroy his impartiality and to establish the truth of whatever he has tentatively assumed. For in this case the expectation of a certain result does not simply act as a selective agency in sifting the presented facts—an effect which it has in all fields of research—but also contributes directly to the reconstitution of the material results themselves by unconsciously producing those very reactions which are anticipated in the hypothesis formulated.

The extreme form of such a priori bias appears in the invasion of the field of science by certain logical or metaphysical preconceptions regarding the world. Historically this confusion of formal adequacy with material availability has been the bane of science. Obsessed by a wholly non-scientific interest, men have clung to a thousand hypotheses because they were simple, beautiful, consistent, or possessed some other excellence as pure forms, and have thereby obstructed the progress of human knowledge. Assuming man to be the ideal end of creation, the earth, as his habitation, was placed at the centre of things and the whole physical universe made to revolve about him as its pivot. So long as students of nature clung to this theological idea, it was impossible to achieve a true conception of their relations or to express them by means of a simple and adequate law. Again, if one be possessed by the notion that, because a circle is the simplest or most perfect of geometrical figures, it must constitute the curve through which the planets move in their courses, he will be blinded to the real significance of their apparent motions and will distort them to fit with his preconceived theory. Or, if one begin by defining the soul as a simple indestructible substance, he will be committed to a logical concept which makes true scientific observation and generalization impossible so long as it is maintained.

Theoretical knowledge is the organization of experience under general principles. Applied to the order of facts, it is the treatment of phenomena in terms of their common characteristics and antecedents. The general datum of knowledge is presented as a logical chaos which it is the function of intelligence to reduce to order and express in concepts and laws. The variety of individuals included within a given class is indeed but a function of the variety of phenomena which we subsume under a single law. What the one represents as a coexistent group of characteristics, the other conceives as a temporal succession united by causal dependence. The law stands for a grouping of dynamic relations, and expresses the range of individual changes which we have succeeded in bringing within a single formula. Each scientific hypothesis depends for its acceptance upon the success with which it synthesizes the content of experience. Thus a concept which at one time is acceptable—for validity in science can mean only adequacy in expressing the relations of facts already known—may be rejected at a later time because of the discovery of new facts which cannot successfully be brought within its terms.

In the growth of knowledge, therefore, the system of scientific laws which expresses our conception of the nature and relations of things must be continuously modified as the bounds of observation are enlarged and new facts added to the old. Science advances through the reaction of new truth upon old theories, which are extended, modified, or replaced by more adequate conceptions according to the relations between the old and the new. The only criterion which we have to guide us is the completeness and simplicity with which the hypotheses in question respectively explain the group of facts to which they are applied.

In ascertaining the genuineness of a signature, in establishing the guilt or innocence of a prisoner, in determining the authorship of a book, in interpreting the symptoms of a disease, the question is always that of discovering a formula in terms of which the phenomena may be simply and completely reduced. The process may be called, in general, the reconciliation of concepts. A loss of adequacy in an explanatory hypothesis appears through the enlargement of the class of cases falling under it. At first, this is met by modifications of the theory in inessentials; but, if the pressure continues to increase, search is made for another concept which will successfully integrate the whole system of facts, and the earlier concept is finally set aside.

Not only is there progressive modification of the concepts in terms of which the gradually growing mass of facts within a single related field is expressed, but those obtaining within adjacent fields come at last into contact and necessitate adjustment. All such fields are assumed to be ultimately harmonious, so that if facts in one class of phenomena contradict any hypothesis which has been applied in the treatment of a related class, that hypothesis must either be modified or laid aside. A concept is to be sought in terms of which all the related facts can be stated; nothing less will satisfy the mind. As every special science is but a portion or a phase of knowledge in general, the ideal of science can be stated only in terms of a unitary system of concepts covering the whole field of phenomena. It is the complete organization of knowledge concerning the facts with which it deals.

The extension of science proceeds in three general ways. The first is by a discovery of new fields for investigation. Groups of facts not previously known are added to the range of phenomena to be classified and explained. Thus, through the discovery of fossil plant-remains in sedimentary rocks, the department of paleobotany has been added to the study of contemporary plant forms. A similar geographical enlargement has taken place in the science of zoology; and, through the discovery of microörganisms parasitic to the living body, the study of pathology has likewise been extended into a new realm. Thus also the conception of the social mind and its activities enlarges the field of psychological investigation by the addition of a new system of facts which exists side by side with that of which individual psychology takes account.

The second form of advance depends upon the subdivision of an existing field through the increasing exactness and complexity of knowledge concerning its contents. In consequence of this, a system of differentiated factors is developed, the growing bulk and importance of which finally necessitates the division of the general field into independent areas. Instances of this are to be found in the addition of histology to anatomy, or of physiological chemistry to physiology, and in the resolution of botany into plant morphology, plant physiology, ecology, and the like.

The third general form of scientific advance arises from the extension of explanatory principles in such a way as to embrace in a single system two or more fields of phenomena, each of which had hitherto been treated under its own independent system of laws. This modification results in the addition of a more general science through the synthesis of principles common to a group of related departments. It is exemplified in the rise of biology, as a science of living organisms in general, from the more specialized sciences of botany and zoology. It is manifested in the substitution of the conceptions of molecular physics for the several specific laws of light, heat, electricity, and magnetism. It is represented also in the extension of the conceptions of molecular physics into the fields of physiological absorption and resistance, of osmosis and turgidity, of nervous irritability and anaesthesia.

The first of these types of change is of minor significance in relation to the general methodological development of knowledge. Its occurrence marks the extension of science but not necessarily any vital advance in its methods, concepts, or results. The second and third types indicate more essentially the character of progress. The rise of new sciences is due, it may be said, to either of two processes, analysis or synthesis. The former is represented in the subdivision of an existing field on account of the increasing complexity of its content as revealed by direct inspection. It is intimately conditioned by advance in the mechanics as well as the methods of investigation, and constitutes the progressive specialization of science. The rise of new departments of research in this way marks the successive resolution of complexes in a series of more and more elementary units.

The rise of new sciences through synthesis represents the final and highest function of reflection in empirical knowledge. It can appear only when the particular phenomena of each related field have undergone thorough examination, and presupposes long and systematic observation of individual fact. The three phases may thus be said to follow one another in the order given: the rise of geographically new fields of exploration; the subdivision of each field into separate provinces, forming the basis of a group of special sciences within that general field; and finally, the unification of any such group with other related sciences in a more general system. The scope of investigation is thus continuously extended, while, at the same time, the content of individual phenomena and of special law within this general field is growing increasingly complex, and the whole series of known facts is drawn into closer and closer relationship through the formulation of concepts of increasing generality.

The ideal of science may therefore be described as, first, an exhaustive examination of the characteristics of objects and the assignment of each to its proper place in a complete classificatory scheme which shall exhibit its relations with other objects, from the most specific to the most general; and, second, a system of laws which shall express the causal and genetic relations of all phenomena in terms of theoretical units continuously developed from a common basis.

In the classificatory sciences, this result is attained by inspection. The search is for increasingly profound principles of resemblance which shall bring the whole field of phenomena into more intimate and comprehensive relationship, and for more penetrating discrimination of individual features for the purpose of an exacter division of objects within each field. Every advance in classificatory science implies a return to the process of inspection, a reëxamination of the field for hitherto undiscovered features. It is an examination not of new things but of the old things in a more exact and exhaustive way, by means of new instruments or with a new object in view. This is seen, for example, in the impulse which physiological investigation received from the discovery of stains having specific effects upon a series of microörganisms, and from the determination of internal secretion and its mechanism.

Questions as to the exactness and adequacy of a classification can be answered only by an appeal to the facts, an appeal incessantly renewed; and reconstruction of the scheme of relations must be faced as its possible outcome. It has already been pointed out that unsuspected richness may thus be revealed in any field within which, according to general belief, finality had already been reached, as in the discovery of invisible rays, of radiant energy, of microörganisms, of cellular metabolism, and the like.

In the history of introspective psychology, the development of this inner richness of content has been equally striking. It appears in the determination of individual types of sensory imagination, of visual insensitiveness during voluntary eye-movements, of the nature and constituents of emotion, of the conditions and antecedents of voluntary movements, of the make-up and course of the thought processes. In the recent advance within this field, nothing has been more significant than the internal complexity which individual experience, in its normal as well as abnormal aspects, has been found to present.

In explanatory science, the appeal is to experimentation. The whole group of historical sciences deals with the concept of causal and genetic law, as that of the descriptive sciences deals with the concept of character. The establishment of such law is mediated by a process of prediction and its fulfilment. The law asserts a specific relation of cause and effect which is tested by observation of the result which follows the appearance, in a selected situation, of the postulated antecedent.

Observation of the unmodified occurrence of events, however, is beset by difficulties which habitually render its outcome uncertain and frequently make any definite conclusion impossible. Natural events occur in a complex of relations so intricate and far-reaching that it defies reflective analysis. The working of any agency is affected by a system of impinging forces which give it, in each individual case, a unique specific form. The materials on which it takes effect are similarly modified by the totality of their relations with other things at the moment. In its actual dimensions, the cause of anything is nothing less than the whole system of conditions, whether immediate agencies or modifying circumstances, which have been concerned in its production. And the effect is similarly diffused in a wave of reactions wherein the phenomenon under actual observation constitutes merely the centre of disturbance in a general field.

To measure each factor in such a system of antecedents and to assign its specific causal value is wholly impracticable. Unassisted observation, depending upon the natural course of events, affords no adequate means of attacking the general problem of explanatory science. Here, as always, intelligence is helpless when confronting the unmodified flow of intuition. Means must be devised for breaking up its connections and allowing the individual relations of any object to be studied in independence of its context of associates.

In the establishment of this technique consists the general development of experimental method. The details of technical procedure can be formulated only in connection with the specific conditions to be met with in a given science. But there are certain features common to experimentation in all its applications the statement of which belongs to a general review. Experimental method is confronted by two problems, one of which may be described as theoretical, the other as practical; it seeks the simplification of problems and the control of conditions.

The first consists in a reflective analysis of the totality of conditions which practically affect the issue, and the substitution of an examination of each of these in succession for an observation of their combined effect as it appears under the natural conditions of experience. A single causal relation, as definite and precise as possible, replaces the confused multitude with which ordinary observation must deal. The effect of this isolation is to give certainty to the perception of relationship and to afford prediction a degree of specificity it could not otherwise attain.

If actual isolation be not feasible—and commonly it is not--experimentation seeks to secure uniformity in the conditions under which the succession of observations is made, as an alternative means of determining the nature of the effect produced. For if these conditioning circumstances be supposed to modify the result in a definite direction, their influence will appear in a uniform addition to the effect in all members of the series alike, but will not, in other ways, disguise their features. Incidental sources of error being thus eliminated or equated, the factor to be observed is systematically varied and the effect of each variant determined in succession. The direction of this experimental modification of the stimulus depends upon the particular nature of the problem. In general, however, it takes the form of a quantitative variation, since the aim of science at large is to develop a method which will allow the statement of its results in measurable and comparable terms.

The control of conditions enables the experimenter to repeat his observation at will. The theoretical reduction of a problem to ideal simplicity, and the arrangement of a systematic series of variations, is futile unless there be some means of securing the production of each of these modifications in the actual succession of events. In cases where such control has been out of the question—as in certain astronomical problems—it has taken ages to accumulate sufficient observations to ground any exact conclusion. Control of conditions is therefore sought, in the first place, to secure a more rapid accession of data; and the increased rate of advance in modern scientific discovery is largely due to the general development of experimental method.

But the more significant aspect of experimentation is its alteration of the natural conditions of experience in order to isolate and test the effect of single factors in the complex of causes to be examined. Experimentation is essentially this artificial simplification of the conditions under which a given event occurs, as a means to the establishment of its specific causal relations. The result is a certain schematization of reality which must in many ways affect the interpretation to be made of its results. It is at the same time bound up with the very conception of experimental method, for it is only under such artificial simplification that precise conclusions can be drawn. It is part of the art of life, rather than the task of science, to become aware of the corrections and supplementations which must be made in applying the conclusions thus formulated to the complex materials dealt with in practical affairs.

The methods of descriptive and historical science, which have here been discriminated, nevertheless belong to a single general type. Every classificatory and causal concept is the result of a process of induction from individual facts. It is attained through what may be called experimental observation—the examination of a phenomenon under the light of a logical concept. The technical differentiation of experiment from observation is of secondary or methodological significance alone. Experimental observation is the universal method of science. By its application, every individual concept is tested; and, through it as a general method, the whole synthetic body of truth in which science consists is elaborated and organized.

From its very nature, no deductive science of phenomena is possible. Empirical knowledge does not aim at the creation of an ideally complete logical scheme, such as might be attained by adopting a group of postulates and developing them systematically. In an a priori science, this is not only possible; it is the method fundamentally expressed in every such science. Mathematics and logic are not empirical schemes invented to describe the form of phenomena, but systematic conclusions deductively established and developed by continuous synthesis from a common origin.

For descriptive science, only one formula is finally conceivable as the adequate expression of a given system of facts; but, in such sciences as mathematics, any number of alternative systems may be elaborated. The logical requirement of any one of these is simply the definition of a specific set of postulates and their consistent development in a rational series of conclusions. Systems of this kind, based upon assumptions logically different from those represented in sciences already organized, have been developed, for example, by Riemann and Lobachevsky within the field of mathematical construction in their respective systems of non-Euclidean geometry.

In an a priori science, the conclusions are necessitated by their premises, but the assumption of the premises in question was not itself required. In descriptive science, the premises are fixed, that is, they are not assumed but objectively given. These premises—the empirical data—constitute a system of criteria to which every conclusion must be referred and by which every result is to be tested. This objective reference to a specifically defined set of facts is especially important to observe in the study of mind, since the points of view involved in metaphysics are related with peculiar closeness to the subject-matter of psychology. The danger is, therefore, great that this foreign system of assumptions may impinge upon and deflect the psychologist's vision.

The metaphysician's point of view, while it is allied rather to the a priori than the a posteriori sciences, falls in strictness within neither of these two groups. It is not concerned with the pure deduction of a system of concepts from the fundamental axioms of reality, nor with the pure correlation of the facts of experience. Its task is unique, for it is required to deduce from these axioms a noumenal system with which phenomenal existence shall be consistently congruous. While it thus begins with general concepts, its goal is not a series of constructs determined by their purely logical relation to these concepts, but such a system as will give a rational account of the individual facts of experience themselves.

Within either of these systems—the purely rational or the purely empirical—no danger of intellectual confusion arises. Logic is a systematically continuous series of concepts whose validity involves only their own interrelations. Natural science is a systematically continuous description of the correlation of phenomena, whose validity involves only its applicability to the facts in question. Neither professes to do more than this. The logical system has no reference to objective or material truth; the scientific law has no transphenomenal application. But the metaphysical activity has its origin in the one form of reality, its end in the other. It offers a deductive interpretation of the facts of experience.

Applied to the field of mental phenomena, its procedure gives us a reconstruction of the content of consciousness based upon a system of noumenal axioms—as, that the soul is a simple and indestructible substance, that all the manifestations of its activity must have a unitary significance, that the subjective and objective aspects of reality are logically separable but metaphysically single, and the like. The result is a system of ideas which may be of value in philosophy, of interest to the logician, or of significance as an object of aesthetic contemplation, but which does not at any point touch the domain with which the psychologist deals.

Historically the product of such a treatment has been called Rational Psychology, but the name must not be misconceived. Rational Psychology is a part not of science but of metaphysics. It contravenes the whole system of requirements on which descriptive science rests, for it starts with a fixed conception of the nature of mind, its subject-matter. Such a conception it is the ideal of all descriptive science to attain, but only as the ultimate theoretical goal of its inquiry. Rational Psychology conceives mind as a unity, and seeks to set forth the system of mental activities as an expression of that unitary being; or it starts from the contrary metaphysical assumption, or from some still other modification of this postulate, and upon the same basis of deduction, proceeds to develop its specific features.

Descriptive psychology, on the other hand, conceives its field at the outset as a series of events in time within which unity will appear only in so far as correlation and genetic continuity are discovered. Rational Psychology must proceed by a series of logical deductions to establish the conformity of mental life to its systems of metaphysical axioms. Descriptive psychology must advance by induction from the series of psychoses which mental life presents, and develop its laws by constant reference to these facts as the final criterion of their validity.

Wherever the conceptions which underlie Rational Psychology are allowed to possess the mind, its procedure ceases to conform to the requirements of natural science, and observation loses all empirical value. For these assumptions weaken the objective reference in its treatment of materials, and dull its sense of fact. They tend to make the student satisfied with establishing clear logical relations between one conception and another as he develops his thesis, and lead him to overlook the necessity of verifying the truth of his formulations by a close and continuous study of the phenomena which they are supposed to unify.

The psychologist must be especially vigilant in his criticism of the assumptions involved in his work and in care that his method shall be consistently inductive, since the field is in a sense but newly possessed. In the early history of every inductive science, when its fundamental laws have not yet been clearly formulated and the accumulation of individual observations goes on at a pace so much more rapid than their rational synthesis, there is danger that the system of inductively established laws may be supplemented by a series of metaphysical or mystical inventions which can have no place in science. This has given rise to various pseudo-psychologies, like spiritualism, in which an attempt is made to work the incongruous mass into a single system of concepts. There is then especial need that, in the science of mind, each formulation shall be made in clear and conscious correlation with the facts which it integrates.

At the same time, a danger of the opposite type must perhaps be guarded against in psychology—an exaggeration of the significance of experimentation and a misconstruction of its function. It is, indeed, not in the study of mind alone that the office of experimentation has been misconstrued. Its product as well as its method have been regarded as in a way independent of the formulation of theory and the application of logical criteria in validating it. So far has this division been carried, though without ulterior intention, that the young student is liable to receive an impression that in theoretical and experimental science respectively there are two separate fields of inquiry.

The rise of this point of view results in an overemphasis of the value of a mere accumulation of data and a disparagement of their interpretation. To heap up experiment upon experiment, to establish individual characteristics and relations without end, and to cry for more facts and always more facts is not merely to use the method of science wastefully; it indicates a certain blindness concerning the real end of inquiry itself. The eye of the scientist is always filled with a vision of law. He sees every fact in the light of a general concept, and relinquishes that which has been found inapplicable only to grasp at and apply another. The formulation or testing of a theory is the end of every observation. Facts are but stepping-stones to concepts of relation. The greatest experimentalist is he who can do with least experimentation, who seizes the essential point of an hypothesis and is able to devise a crucial experiment to test its validity. Not the multitude of his experiments but the rank of the synthetic concepts he has formulated marks the scientific value of any individual's work. Experimentation is of instrumental significance only; it is the universal method of approach to the problems of science.

When no longer a principle of investigation but merely of instruction, the experimental method may be considered in independence of abstract formulation. In this use, experimental demonstration has both its characteristic advantages and its peculiar imperfections. As a method of presentation, it exhibits the law in its application to facts. In this respect, it is allied to the method of the arts, which exhibit the ideal in a concrete individual type. The impression which such a demonstration makes is vivid, and it is effective in arousing interest, as is every spectacle. But the method suffers from the disadvantage that it presents an example instead of formulating a law. To understand is to apprehend the concept whereby a group of facts is integrated. This concept is expressible only in terms of an abstract law; it cannot be made visible in an instance.

In experimental demonstration, the law, as a generalized concept, is liable to be lost sight of and its exemplification apprehended as an isolated fact. In the latter case, the experiment has been nothing but an impressive spectacle, and the interest evoked has been merely that of the child who is attracted by all intense impressions, while it fails wholly to comprehend their significance. In using the demonstration method, therefore, one must be careful that attention is not dissipated among the many confusing facts presented. This can be obviated only by consistently combining with the experimental treatment of any subject a continuous translation of its results into terms of abstract law. In that system of theoretical concepts, as has been said, lies the whole significance of the demonstration as well as of the original investigation.

As to the products of inductive research themselves, there can, of course, be no question. A division of facts into theoretical and experimental systems is absurd. There is no distribution of the field or content of knowledge into provinces corresponding to these terms. Nor is there any distribution in point of method, for all determination of natural law is through experimental observation. Theoretical science is but the body of truth continuously elaborated through the experimental verification of hypotheses. The distinction implied by these two terms is of pedagogical value only, scientific investigation being a unitary process of which both are indispensable components. The system of materials used in any experimental course in science represents simply those typical or classic tests by means of which the chief features of its law have been established.

In psychology, as in all other sciences, the experimental method must be conceived as the universal mode of approach to its special problems. The provinces of mental activity differ in complexity and in their forms of combination, in their physical conditions and the situations in which they are evoked, but not in their essential nature or the methods by which they are to be attacked. If one function be physically conditioned, none can legitimately be exempted from this assumption. If one be treated as a temporal process, all must be so treated. If one be conceived in terms of an abstract unit, the same conception must be applied to the whole series of mental phenomena. Similarly, if one function or relation be held subject to an experimental mode of treatment, no range of materials or form of activity may be exempted from such treatment. The whole mental life, in so far as the psychologist deals with it, must be conceived as a system of facts to be approached by means of analysis with a view to the formulation of descriptive laws, the verification of which is to be systematically accomplished by application to the facts from which they were derived.

## CHAPTER V

## PSYCHOLOGY AND THE SYSTEM OF KNOWLEDGE

IN man's general reaction upon the materials of experience, every science and every art will find a place according to its specific contribution to human good. The system of arts reflects the range of modes in which the satisfaction of desire is sought through a utilization of plastic materials. The system of sciences represents the variety of phenomena which experience offers to the understanding. The members of these two series have not only internal relations within the limits of their own group but possess many and intimate correlations with the opposite series. The significance of any science, therefore, must be considered both in its connection with other branches of knowledge and in its bearing upon the adjustment of practical relations with the world. And, finally, the arts and sciences, together with all other forms which the will's reaction may take, are to find place in a rational system of culture as expressions of the ideal values which experience contains and the aims in which they are defined.

In any such consideration, preference and appreciation must be presupposed. Every reaction of consciousness, every teleological adaptation, in order to be understood at all, must be conceived in terms of some specific end or principle of selection as its determinant. The presence of this ideal is the final ground of distinction between motion and action. The situation must have significance for the subject of experience, either in its immediate effect upon his sensitive constitution, which it affects pleasurably or otherwise, or in its instrumental value in relation to his ideal purposes, as a help or hindrance to his aims.

But such general ascription of value is of little practical use. It is a postulate which is necessarily assumed, but explains nothing when applied in the solution of any specific problem. One cannot discover the "real" value of experience by fusing all individual significance in a mystical sense of unity, whether with humanity or nature or universal being. Value, like beauty, is specific; and excellence of any quality loses its meaning when amalgamated with virtues of a different order. It is of course true, on the other hand, that our individual ideal aims have common elements which enable us to group them in certain large classes for the purpose of description.

Human culture—if the term be used to express this general system of ideal values—may be said to comprise three factors: man seeks for himself a spiritual order, an intellectual order, and a social order. The first of these is a sense of unity with the world of being as a general ground of action. The second is a sense of unity with oneself—an inner consistency in the system of judgments which individual life expresses. The third is a sense of unity with one's fellows in an organized life. These three factors have a logical relation and development. The first-felt need of man is to bring himself into harmony with the world-order. He worships before he thinks for himself or acts for himself. Religion, in human history, precedes both science and statehood.

The liberation of the individual follows. Man creates natural law after he has found his God. Rational thought is achieved only when the sense of religious unity and significance has become thoroughly grounded in the consciousness of a people. In its earliest forms, philosophical reflection has universally had a religious content. It is in the service of religion that science takes shape, and metaphysics develops as a logical ground by which the thinker seeks to give form and unity to its conceptions. Similarly, the rise of the fine arts—which, equally with science, reflect the dawning conception of a principle of ideal order—is conditioned upon the existence of a secure religious consciousness; and, at the outset, art appears as a means of rendering sensibly vivid the symbols of a people's faith.

The product of intellectual liberation is free self-determination. The creation of a rational order is only begun in the development of natural science. Its essential nature appears in the attempt to establish logical canons for the general reduction of experience; and its completion is achieved in the solidification of ideal criteria for a general interpretation of the values of experience. This holds true whether we consider the scientific and philosophical interests on the one hand or the aesthetic and practical on the other. As a result of this development, the individual conceives himself as an autonomous being. To his own satisfaction—in its highest form, to his own development—all experience is to be made to contribute; and, in terms of his own nature and ideal aims, its value is to be construed.

Upon this phase of evolution follows the third factor of culture. The sense of unity with one's fellows is the latest phase in human development both logically and historically. At the same time, it is, of course, true that an instinctive aptitude for coöperation has established a tradition of alliance in every human group long before the ideal of intellectual liberty has received conscious definition. A social order arises from the sense that a life in association is the necessary form of human existence. The individual sees in this larger spiritual environment the logical condition of his own development and the material through which alone he can adequately realize himself. Autonomity gives way to mutual dependence, and the individual becomes a citizen; for it is perceived that subjection to law is the way to emancipation, whether its theatre be individual or social.

In the historical development of culture, these three factors may be represented in the respective contributions of Judea, Greece, and Rome, to the social inheritance of mankind. To the Hebraic mind, we owe the foundations of our spiritual order, in the harmonization of the individual will with universal being through the conception of the fatherhood of God. To the Greek, we owe not merely the invention of specific intellectual and aesthetic forms of the first rank, but the very conception of subjective harmony and development as an ideal end of action. To the Roman, we owe the principle of justice and the general conception of a social order expressed in the organization of a system of human wills.

In Judea, the essential foundation of all religion was laid in that ratification which the ideal aspirations of individual life receive from a sense of alliance with the Absolute through a sympathetic identification with the divine will. In Greece, human reason came to self-consciousness, giving to rational thought its final status; but it failed to transcend subjectivism, and ended in national disruption. To her, we owe the lasting foundations of science and philosophy; but her polity she herself destroyed through rational criticism, because it was not founded on permanent principles of statehood. The theoretical basis of a social order was first consciously formulated when, within the Roman Empire and prepared for by its principle of justice, the conception of a universal spiritual community was preached by the Christian brotherhoods; for it is only under the condition of equality among free individuals that those relations of will and value can arise which constitute a human society.

In each of its fields, culture undergoes development; and—though its advance is not saltatory but continuous—progress may be represented under a succession of typical phases. The products of all such analysis express logical aspects of development rather than historical stages in the evolution of culture. Thus, while the conceptions in which it results may be employed to mark the history of civilization, they will also find application in the description of any social group, in the sense that its members will represent all levels of culture. The individual subject of experience, similarly, will be found to pass from status to status in his ontogenetic development, and even—like a social aggregate—to represent in his various adult judgments a wide range of cultural differences.

If we thus seek to mark revolutionary changes in the conceptions with which man confronts the world, the successive attitudes of mind revealed by the history of culture may be expressed by the terms Anarchy, Slavery, and Liberty. Anarchy represents that theoretically primitive condition from which the evolution of culture takes its start. It is, of course, impossible to illustrate this state in its purity by any historical community; but, from the status of savagery as well as the initial stages of individual development, its features may be defined.

In anarchy, an ideal order has not yet been achieved. Mind and world are alike chaotic. Man is without science, without morality, without a state. Magic and miracle prevail in nature, for the conception of uniformity has not arisen to give origin to natural law. Change is referred to a multitude of individual beings as its source. Worship is non-existent, the religious attitude being exhausted in the propitiation of a local fetich conceived as a principle of interference and malevolence. Man is without tradition or a sense of values. Organized society lacks a basis of existence, for there is neither authority nor conscience.

In the status of slavery, man's first sense of order is embodied. The conception of law exists; but authority is imposed upon man, not created by him as a means to self-realization. To this external order, he is subjected; and life is consumed in the endeavor to conform thought and action to its requirements. Authority is referred to a supernatural origin. Kings are children of the Gods, the conception of sin is ceremonial, and all wrong is the formal transgression of an arbitrary will. Knowledge, which comes through revelation as contrasted with reason, is the prerogative of a special caste; and thought is hemmed about by a system of sacred mysteries. The conception of the individual is marked by an absence of the element of free development, and his place is fixed in a rigid social organization. He is the slave of ancestral tradition and supernatural fears. Institutions are conceived in terms of absolute worth as having a divine origin, and are not subject to modification or development.

In liberty, the ideal order which man creates attains finality. Liberty is the conception of the world as a system of means whereby self-realization is made possible. In this status of culture, authority is no longer foreign, though it is still objective. It is necessary, but not an extraneous imposition. The individual is subject to law because he is the subject *of* law—because order is necessary to the realization of his own ends. In the status of liberty, man creates that form of order under which he exists. Law is the reflection of his essential aims. He is subject neither to external authority nor to his own past. Ideal development under law is the fundamental expression of his status.

In the field of knowledge, this principle appears in the conception of rational criticism and the sense of natural law. Truth is not supernaturally revealed; it is the product of human reason, unhampered by taboos, which finds its application throughout a continuously widening field. In a liberal human culture, also, knowledge is free to all; it is not confined to a caste or subject to institutional criticism.

The ultimate seat of authority, under liberty, lies in the subject of law himself. His very gods are the hypostatization of his own ideals, for he conceives the universe in terms of his essential aspirations. Right is that which approves itself to his own conscience, the sanctions of conduct having at last attained a genuine morality. Statehood is the objective embodiment of a socialized will, deriving its authority from the commonwealth and being finally responsible to it. Institutions are created to meet specific social needs, and are maintained only so long as they further the welfare of those who live under them. Education seeks the production of free individualities capable of self-direction in an ideal evolution subject only to the limitations of natural capacity.

Liberal culture, like social order, is grounded in the conception of spiritual community—without which neither understanding nor coöperation would be possible—for the objective condition of all positive development in the individual is provided by the system of cultural materials possessed by the social group of which he is a member. The free self-determination of liberal culture implies both the recognition of self-direction in development and the sustaining of reciprocal relations in an organized social life. It means the enrichment of the general spiritual inheritance by a cultivation of diverse individual aptitudes and the deepening of personal existence by a universalizing of these elements of culture.

Thus, in its social aspect, the advance toward an ideal human culture does not consist in the development of a mere sense of kind, though it postulates a sympathetic identification with the reactions of other human wills, but involves at every step the specialization of its individual units. This internal differentiation, however, is but the necessary condition of a highly developed society, every specific modification deriving its significance from the contribution it makes in extending the basis of social existence or heightening its quality. In becoming distinct, individuals and groups take on more intimate relations instead of securing a functional independence through mutual withdrawal.

The internal development of individual life follows a similar course, and its essential features are reflected in the history of culture objectively. Evolution within each special field of activity is marked by increasingly exact distinctions within the subject-matter and by a progressive definition of its specific aims. At the same time, the development of this systematic awareness of an independent existence is accompanied by a growing perception of its place in the general system of ideal products which our activities at large are bringing into existence. The full cultural service of any science or any art can be achieved only through an unreserved acknowledgment of its specific limitations and devotion to its technical aims alone.

The history of thought, like that of action, reflects these elements of progress. In its aims, as in its conditions, life may be described as a unity of existence, and thought has a common ground with action. At the beginning, the fact of this unitary source overshadows the distinction in specific function; and the value of knowledge, as such, is not recognized. The result is a confusion of the principles of explanation with the practical requirements of adaptation, or the sentimental preferences of the subject. Within the field of reflection, similarly, the variety of regulative conceptions which differences of aim necessitate is not apprehended. From this, a second form of intellectual confusion arises which, for example, has repeatedly obliterated the distinction between scientific explanation and metaphysical interpretation.

These problems, in their bearing upon the mental sciences, are to be taken up at a later point, when both the specific relations of psychology to other sciences and the general significance of reflective thought for the practical arts of life will be considered. In the present instance, therefore, we are concerned only with the connections of that science in the reactions of the human mind at large, and the limitations which its progressive definition have imposed upon the conception of its place in the general system of truth.

Psychology is a system of empirical knowledge having a subjective field and a theoretical aim. Theoretical interest in the world waits upon the solution of its practical problems, and an interest in subjective phenomena arises late in the history of man's systematic examination of reality. Theoretical inquiry begins with a study of material things and the succession of events in external nature. The first problems to occupy human attention were doubtless the fundamental considerations of food, shelter, and defence. For ages after the transition to a distinctively human status, man must have been fully engrossed in these pursuits, as are the lowest savages existing to-day. The exactions of such a pursuit were great, however meagre the outcome may seem to us when measured in terms of its adequacy as a provision for life. The insistency and rigor of its demands called for a high though narrow development on the part of all those individuals who succeeded in it. The general conditions of practical success remain unchanged, however great the variations in the specific ideal which determines man's activity, or in the circumstances under which it must be realized.

The maintenance of life involves choice and effort. All that increases activity and refines the capacity for selective perception furthers its prosperity. The organism which cannot discriminate and that which cannot react suffer alike; it is the alert and active who thrive. Through every grade, this law has been acting upon the life of the earth. Sifting and selecting, fostering and eliminating, it has moulded their plastic substance into greater and greater conformity with the conditions of existence; and, by an inevitable process, limited only by the range of variations in the materials, has thrust each type forward on the course of its adaptive evolution. Development or destruction is the law of life; the earth is the natural home of perfection.

About the individual and the type which survive, as a result of the struggle stimulated by these conditions, cluster all those elements which make for success; while inferiority of function and defect in form are continuously eliminated from the advancing type. Through this process, organic species at large have taken shape. If the conditions of learning or modification be given, the selective environment will do the rest. Grade by grade, its adaptation will be increased, function profiting by the elimination of wrong reactions and structure by the suppression of unfit individuals, until type as well as reaction is revolutionized and organic evolution is added to individual development.

Out of this struggle and response has come the succession of living types, each new form representing the permanent embodiment of a group of specific qualities superior in adaptation to those of the lower species which preceded it. Every feature of physical and mental constitution is seized upon in this vast formative process. Each aptitude is an element of strength; each inaptitude, a factor of weakness. Here the progressive specialization and refinement of sensory discrimination have had their origin. The power, rapidity, and exactness of reactions, as well as their unity and complex combinations, have been fostered through this process. The modification of reactions to present stimuli by the results of past experience has been seized upon in its course, and the development of range and availability in memory determined. It has fostered the capacity to learn, and made it the condition of all later forms of individual attainment. It has perfected the highest organic type by developing the habit of coördinating experience for the purpose of anticipating and modifying the future course of events, and by adding to the practical interest in affairs that disinterested curiosity which is at the bottom of all theoretical knowledge. It has, therefore, played an indispensable part in a process which, by giving birth to science and philosophy, has made the ground of utilitarian action broad and sure while it illuminates life with a system of ideals and a sentiment of worth.

Throughout this process, the permanent factor in the ceaselessly shifting panorama of forms and habitats, of foods and modes of life, has been the need for adaptation to the environment as a condition of existence. In the world which surrounds the organism lie both life-giving and death-dealing properties. It fosters or destroys according to the character of the reaction made upon it. Adaptation, therefore, does not imply fixity in the conditions under which the type lives, but only the necessary correlation of its system of activities with the specific nature of the environment. Thus modification of the world represents adaptation quite as much as the acceptance of it in its existing form and the adjustment of conduct to its demands.

In consequence of this, the first interest which the world in general possesses is the practical. Control and use have primacy in the system of consciousness and dominate its procedure. Existence is grounded not in reflection upon the world but in adaptation to its changes. Life is purposeful activity; things are objects of reaction; and their first meaning is the notion of their use.

The primary signification of an object thus roots in its relation to practical welfare, and its examination may be called a study of effects. That study takes account only of the utilitarian properties of the object and the practical consequences of the event. Nevertheless, practical interest in the world is not narrow.

It is logically concerned with everything that bears upon the occurrence. There is no element of the event which is not of potential significance. Its secondary and obscure accompaniments can no more be excluded than its salient and characteristic features. The utilitarian attitude of mind thus leads to a large interest in life, and may prompt an eager and sustained examination of the features of the world. But, in the end, it springs from a motive different in kind from that which theoretical interest exhibits.

The object of theoretical study doubtless owed its effectiveness in stimulating attention to the potential bearing upon our welfare which all the elements of our environment possess. Our curiosity as to its nature, however, does not consciously spring from such a source, and intends no refinement of practical adaptation as its result. It appears as a pure intellectual interest. In individual life, this attitude has an independent existence, expressing an instinct which is no less profound and universal than the practical interest itself. We are concerned not only with a study of effects but also of causes. The novel object, whose character and value are unknown, interests us equally with the familiar and significant. The presentation of a problem constitutes a challenge which arouses us like the defiance of an enemy. Intellectual triumph, the discovery of new facts, the solution of problems, the formulation of clarifying concepts, are attended by as distinct and positive satisfaction as is practical success.

The option to meet the challenge or to pass it by—to attend to or neglect the novel stimulus, to feel an interest in the world at large or to be indifferent to it—is indeed not given to us. This reaction is not a matter of acquired habit but of instinct and original craving.

There is a will to know as well as a will to believe. We feast the eyes with new sights and the ears with tales of the unseen world beyond our neighborhood; we delight in travel, discovery, novelty, purely for the sake of that intellectual stirring which they arouse within the mind.

This instinct is reflected in profound and trivial things alike, from the great intellectual problems which have fascinated the philosopher and received the devotion of the scientist throughout the ages, down to the flying gossip of the cross-roads and the personalities of yellow journalism. Interest in the domestic incidents of our neighbors' lives and in the disconnected items of daily news has its justification in a profound and significant human instinct. It is a by-product of that necessary interest in our general surroundings upon which all successful adaptation in the individual and all modification of the type depend.

The world in which we live, in all its aspects, is thus an intellectual problem as well as an object for the practical will. Within this system of interests, the first topic to attract man's attention is the external world, with its multitude of things and succession of changes. From the practical point of view, it is at all times this objective manifold which it is imperatively necessary to study. The adaptation of our acts is first of all to objects, among which other human wills are to be included.

When we reflect upon our own inner experience, it is in terms of our relation to this external world and its changes. Prosperity and adversity are characteristically stated in terms of their physical or social causes. The self we love and strive for is the subject of a system of ideals and purposes which can be realized only through action. The savage conceives soul in physical terms, as a shadow, a breath, a rarified material body. The child, too, is probably late in making any distinct separation between those two aspects of experience which we call the objective and subjective. It requires a certain inversion of the natural or direct attitude of mind to turn the gaze inward upon the activity of the self; and the rise of true introspection marks a high development of philosophical discipline.

The earliest object of man's theoretical interest being the external order of things and events, it is important, in the next place, to recall the nature of his intellectual reaction to it. Speculation, the expression of this interest in a problem of purely logical interest, does not begin with either a sustained and systematic inquiry or a technical method depending upon clearly conceived regulative criteria. Under the conditions of primitive life, there is neither opportunity nor impulse to patient, exhaustive study of cause and effect. The burden of life presses too heavily upon the individual, and imposes intellectual limitations which are prohibitive of such an undertaking. The supplying of immediate physical needs, the avoidance of elementary dangers, so engrosses the time of the meagrely equipped savage that but a narrow margin is left for speculative inquiries. The movement of his mind is also impeded by an inner sluggishness which lets slip those intervals for reflection of which the more alert mind of civilized man makes significant use. The routine of life is too unvaried and general knowledge of the connections of events too limited to make the savage a keen critic of theories. It requires, indeed, a strong stimulus to arouse him from his mental lethargy and to initiate speculation in any form.

As a result, the problems which occupy the primitive mind are aroused only by the unusual and impressive aspects of life, in contradistinction to the systematic inquiries of science, the investigations of which are typically concerned with the routine of experience—that is, with the normal course of events and their relations. In the mind of the savage, it is just the exceptions which provoke comment. The equally stringent logical demand for an explanation of the commonplace is not at first seen. Its very familiarity is conceived as constituting, in a way, its explanation.

The routine of experience being thus accepted uncritically, it is only departures from its course which arrest attention. Even in our own day, popular conception confounds the remarkable with the extraordinary, and the wonderful with the exceptional. It is the latter class of occurrences, also, which must first have stimulated human speculation. Such are extreme changes in physical conditions—storms, drought, floods, great heat and cold, incursions of wild beasts, plagues of insects, disease, monstrosities. Such also are those still more perplexing and subtle phenomena, the intermittent accompaniments of certain commonplace things and acts—shadows, reflections, echoes, apparitions, dreams, and the like.

The solutions offered in connection with this general system of problems are, first of all, crude in character. The thinker had neither the means nor the patience to test the truth of his own theory in what we should call an adequate manner. The causes to which any event was traditionally referred, though frequently associated with it by the merest accidental bond, were scarcely subject to question; since that general knowledge of the systematic connection of events, out of which such a challenge must spring, did not then exist. The sense for inconsistency, which rests upon a world of orderly intellectual conceptions, was lacking. The absurdities and superstitions revealed in proverb and folk-lore are a natural outcome of the strivings of a mind which is thus hungry for an explanation but has no refinement of taste to guide it in the selection of proper nourishment. Tracing the succession of events from effect to cause in accordance with natural laws was not possible, nor was it demanded. The world appeared as a multitude of individual things and events, to be accounted for by reference to a like multiplicity of unrelated causes.

In the second place, the speculations of the primitive mind are characterized by the fact that these causes are not themselves events like those to be explained, but agents—as the human will is an agent—in the production of changes in the external world. As a multitude of acts is explained by the variety of human wills behind them, so the processes of the world were explained by reference to spiritual existences, to gnomes, elves, dryads, and pixies, to gods and demons, to deities of earth, air, and sea, in all their forms.

This method of interpretation was extended, as speculation progressed, to the slower changes and more regular processes of the world. Tree and stream became sensitive and passionate, possessed of active inner wills. The seasons, the fruitfulness of the earth, the heavenly bodies, had each its impersonation as god or goddess—spirits which, unlike the idealizations of human virtues in the gods of war and justice of later theogonies, were simply original vital powers of which the events and processes of nature formed the expression.

The peculiarity of such an explanation is that it places the cause not only beyond the limits of observation but in a wholly different system of conceptions. The series of relations cannot be continuously unrolled until its origin is reached. At some point, a break appears in the series, a break which is not simply the dropping out of one event from a chain of similars, but an unbridgable chasm. It is indeed the ancient difficulty which appears in treating the relations of mind and body. The thing to be explained is some physical event or series of events, the movement of an arm or the utterance of speech, the hunting of prey, the bridging of a river, the making of a book. The cause to which it is referred is a human purpose or volition; but, trace the physical series as far as one will, the cause is not reached. One leaps to a wholly new kind of reality when he invokes the direction of a human will as its antecedent.

The likeness between the two cases is more than analogy. In primitive culture, the general explanation which phenomena receive is couched in terms of teleological interpretation, because it takes its origin from an immediate experience of the connection which exists between our wills and changes in the external world. As voluntary movement, gesture, and speech are manifestations of consciousness, so is the multitude of events in the world to be explained by reference to individual spiritual realities. And as the variety of human actions is the result of a multiplicity of individual wills, so are the many events of the world to be referred to an infinity of separate and individual spirits, or fetiches. The attitude toward nature is anthropomorphic and personal. Fetichism is not confined to savage peoples, but is prevalent among various social classes in civilized nations. It is a mode of formulation which the individual frequently falls back upon when scientific explanation fails. The attitude is expressed in superstition, the belief in omens, miraculous interference with natural law, etc. It is a point of view which the individual only slowly outgrows in the course of his development.

Out of the primitive confusion of Fetichism, more general conceptions emerge slowly as the logical habit of mind asserts itself and the sense of law deepens. In this vast nebulous theatre, the shapes of those huge figures, Religion and Philosophy, are already becoming defined. The intellectual demand for an understanding of experience, as the consciousness of its own purpose clears, finds unsatisfying the human and passionate forces to which the poetic imagination had given birth. Logical analysis alone can be applied to the problems of the intellect; desire and sentiment must be thrust aside.

The development of critical thought represents the emergence of the individual from the social and political group in which savage culture merges and obliterates him. Unlike philosophy, which expresses the thinker's own reflection upon experience, religion is grounded in an act of faith, which already implies relation to another self, and is vitalized by social emotion. Myth and religion are manifestations of the communal mind, but philosophy is essentially individualistic in its origin and expression. It reflects the dawning of the sense of autonomy in the self as a critic of experience.

Historically, as it progresses towards independence and continuity, the philosophical habit is manifested, at every resurgence, in the application of logical criteria to the content of religious and political faiths. So long as dogma is accepted, it does not appear; but, when the results of reflection are found to be in contradiction with its prescriptions, the independence of philosophy is forced into view. It is constituted by an act of destructive criticism. Hence the age-long conflict between religion and philosophy, between dogma and reflection, between faith and reason.

Metaphysical speculation, like the conceptions of science, undergoes an evolution which presents both individual and racial aspects. The reflection of any thinker or any age is determined by the whole system of factors which condition experience. Philosophy is an interpretation of the thinker's own world, of the world as it appears to him. With increase of knowledge, the comprehensiveness and rationality of his scheme will be widened. As acquaintance with the facts of his world grows more intimate and critical, his interpretation of them will alter.

Under the varying demands of practical life and changing forms of civilization, emphasis is thus laid now upon one, then upon another, aspect of life; and, with these shiftings in sociopolitical ideals, the centre of philosophical interest likewise changes. In one age, it is a problem of the primary substance from which all things have differentiated; in another, of the vital principle and psychophysical teleology; in a third, of the order which the world presents and our duty as rational creatures. For one generation or people, it is the problem of happiness and the way of attaining it; for another, the immortality of the soul; for a third, the problem of knowledge; for yet a fourth, the question of origins and the form of development.

The point of view which Fetichism represents is neither scientific nor philosophical—it is mythical. A myth is the interpretation of nature in terms of personal forces. It embodies a fused conception in which a problem for science is treated in terms of immediate reality. A description of the cause or origin of the event is called for, but the realties which it indicates are noumenal. The answer is thrown back into that region of metaphysical reconstruction in which the mind attempts to supplement the conclusions of empirical knowledge by a speculative interpretation in terms of experience and value.

Nevertheless, an answer given in terms of myth is not philosophy, though the principle invoked falls within the noumenal field. Philosophy interprets the meaning of experience in terms of a system of logical concepts, and, in this regard, is not different from science in its point of view—that is to say, philosophy no less rigidly than science conceives the world as an object for the understanding. It is a logical inquiry into the ultimate nature of things and the place of the world of experience in reality at large, in the course of which the thinker is called upon to scrutinize the conditions under which such an inquiry is possible and the relation in which human knowledge stands to these conditions. Its appeal, like that of science, is to reason; and its conclusions are presented in abstract terms. Philosophy and science alike find expression in a system of laws.

It is religion which interprets experience in terms of personality—of intelligence, purpose, and will. Yet myth is not properly religion. The object of religion represents the idealization of the moral will. Strictly speaking, it has nothing to do with the understanding and its logical problems. God, for metaphysics, is the ground of existence, a logical concept. God, for religion, is a purposive will, the object of worship. The mythical attitude confuses the two relations; for the primitive myth expressed in a single conception man's explanation of the world-process and the attitude of his will toward reality. It represents in a poetical form both the object of his worship and the ground of changes in the world. The myth is a religious symbol introjected into philosophicoscientific theory.

With the separation in men's minds of these two points of view, with the clarifying of religion and the synthesizing of philosophy, myth came to hold a place intermediate yet independent. Through the progressive refinement of imagination, the treatment of these vivid and personal interpretations approximated more and more to the literary expression of life. For poetry is allied both to religion and to philosophy: its medium is an intellectual treatment of experience; nevertheless it interprets it in terms of appreciation and emotion.

In a word, then, when these several attitudes have attained definition and consciousness of purpose, their functions are seen to be severally independent and unique. Religion is a life, myth a sentiment, philosophy a reflective criticism. Religion—for it is with the distinction between the religious and philosophical attitudes that we are concerned—religion offers an object of aspiration to the will; philosophy presents a problem for solution by the understanding. Religion conceives the world as a system of ideal purposes with which man may coöperate. Philosophy conceives it as an object of knowledge within which man appears as an individual element.

Faith has thus nothing to do with certainty and doubt. It is an attitude of dependence upon a moral will and involves a specific personal relation. The region of religious faith, therefore, is not the purlieus of human experience, a dim province of reality about which, having no direct evidence, we believe that it continues our own world and will ratify our expectations concerning it. The object of faith is essentially concrete whether it be sensible and attainable, as in the case of our fellow-man, or intangible and unrepresentable as in the case of God. The noumenal object of knowledge, on the contrary, is something which is to be intellectually conceived and formulated in logical terms. It cannot be called a phenomenon, if that term be restricted to the range of realities with which science deals; but it is essentially a system of elements set over against the self which considers it.

The realities with which the self deals in social and moral life and in religion, must not be confused with the objects treated in science and philosophy. We have seen that the analysis of experience reveals a dualism in our way of regarding reality. It exists, and it has worth. There is the fact and its world, a mechanical system with its universal laws and necessary causation—essentially a worth-less world. There is also the self with its sensitivity and appreciation, purpose and ideal aim, with the value of experience for it—a teleological world full of development, significance, and worth. At one moment, we view the experience as a fact to be described. At another we regard it wholly as an aid or hindrance in realizing our purpose. With the former of these aspects, science deals; the interpretation of the latter it is for philosophy to undertake.

More intimate relations may therefore be said to connect philosophy with the attitudes and aspirations of the will than those which exist between science and the field of immediate experience. Nevertheless, the procedures of philosophy and science participate in an essential opposition to the attitudes of the ego whether the pole of its activity fall within or beyond the circle of human selves. The reality which knowledge seeks to represent is an object, separated from the consciousness which views it, while the reality to which faith aspires is a subject, identical in nature with the self which acknowledges it. Faith and reason are not differing modes of approaching the same reality. An opposition can, therefore, arise between religion and science only when the nature of one or both is misconceived.

From this point of view, science and philosophy fall into the same category, within which theology is also included, for it is a branch of metaphysics. That which unites these three into a single group is the system of regulative concepts which they employ in common. All alike appeal to reason. They ask for an acceptance of their conclusions on the ground of logical consistency. Both science and philosophy are systems of explanation of the constitution and causes of things. Of both, it may perhaps be said that the activity originates in practical human needs, and that its outcome is, in general, to further human welfare as well as to afford intellectual satisfaction to the individual. The ground and value of science in this connection is evident. If we extend a practical significance to philosophy also, it must be, first, in recognition of the fact that man is ill at ease in the presence of that which he cannot understand, as he is at a disadvantage in the presence of that which he cannot use; and, second, that the will is paralyzed by any ultimate lack of faith in the ideal value of its aims.

These two systematic reactions to experience, however, bear different relations to the practical situations of life. Science is the systematization of that knowledge of things and their relations from which all intelligent adaptation proceeds, which alone makes life and logic possible. Science is a study of the mechanics of experience; philosophy is a study of the worth of experience. The latter thus provides the living principle whose expression through materials necessitates scientific knowledge.

The necessaries of life are not so significant as its ideals, but they nevertheless afford the basis of existence which the latter presupposes. Science is thus more closely related to the elementary conditions of life than is philosophy. Information precedes speculation, and action must be satisfied before thought is free. Science is begotten of hunger and every desperate need which sharpens attention and makes understanding essential; but philosophy is born of a full stomach, for only when man is fed and at leisure does he begin to speculate concerning the causes of things at large.

Thus philosophy, like theoretical knowledge generally, is a late development in the history of thought. It presupposes a certain stability in human life and the assurance of permanent provision of its necessaries. In its systematic forms, it is the product of a stage of human culture in which wealth has been accumulated and a leisure class exists. It therefore constitutes, in a way, the correlative of class distinctions and the division of labor.

But, whatever the specific relation it bears to human needs or the stage of human history at which it takes definite form, science and philosophy alike are conceptual treatments of experience. Each seeks to formulate a rational theory of the objects with which it deals; and, while differences in their subject-matter require the development of special methods and canons in the establishment of their results, the general criteria to which they appeal are identical. The philosopher no more than the scientist asks that the truth in which he believes shall be "felt" or "appreciated" in an uncritical realization of its validity—as, for example, any new simple quality of experience must be intuited in order that it shall be real. He aims to convince by a valid intellectual appeal on grounds critically estimated. The recourse to faith involves nothing of this kind, nor does that to sentiment. Religion does not offer a truth to be proved, but a reality to be experienced. Sentiment reveals an object of worth which another may find of value or not, but is not concerned at all with its descriptive characteristics.

In contradistinction to both of these, metaphysics and science are theories as to the relations of reality grounded in the value of evidence. But science uses the method of demonstration, which is not available in philosophy. Demonstration introduces a change into the causal series and observes its result. Scientific hypotheses are put to an experimental test, and verified by the discovery of facts whose occurrence they predict. Philosophy can appeal only to the rationality of its scheme. It cannot, by changing the order of events within the world, affect the realities with which it deals. It is a reflection upon the nature and meaning of the world which one accepts on account of its inner consistency.

Philosophical reflection, therefore, necessarily takes a universal form. It is a criticism of the general assumptions of experience. For science and for practical life, these are final. The possibility of a knowledge of fact cannot be questioned by science, since its work is an ordering of the constituents of this factual system itself. The existence of science means that the possibility of such knowledge has been assumed. For the world of practice, likewise, the significance of experience cannot be doubted, for teleological action of any kind arises only under the assumption that life has meaning.

At this point, philosophical analysis takes up the problem. These practical and theoretical presuppositions themselves must be critically reviewed and their values assessed. Philosophy thus has two general functions—the critical and the constructive. It undertakes an examination of the conditions of knowledge and a development of the features of reality. Is there an external world, as science and practical life assume? What is the exact nature of the data interpreted in terms of such objective existence? What is the essential procedure of intelligence in construing the world from these data? What can we say of the validity of knowledge at large and the limits of its field? The consideration of such problems as these constitutes the first function of philosophy.

To this critical analysis of the presuppositions of experience, philosophy adds a second undertaking. It unifies the results of science and the purposes of life. In metaphysics, doubt is always instrumental. Criticism clears the way for construction, analysis for synthesis. The purpose of the philosopher is to attain a point of view from which the whole complex field of knowledge and purpose may be unified. He has therefore a second group of problems to consider, namely, the general form and meaning of reality as a whole. Under what conceptions is this unification most successfully accomplished? What is the ground of existence and principle of its construction? What is life; what is death? What is the significance of consciousness, of will, of evolution? Is there a meaning in the world at large, or do we see there only the reflection of our own purposes? The resolution of this class of problems affords that synthetic view of reality in which philosophy finds the realization of its final task.

It is thus not their general form and criteria but their subject-matter and technical procedure which distinguish science and philosophy. The latter is an interpretation of the field of experience in terms of ultimate reality. In its analytic function, it takes up the problem of the human mind as an instrument of knowledge, and strives to apprehend its significance as a condition of such interpretation. In its constructive procedure, it seeks to determine the nature of being and our relation to it. It offers, therefore, a system of concepts which depends for its acceptance upon its inner consistency and which can never be put to the proof. The adoption of any philosophical theory or point of view takes place because its implications are found to afford the most rational interpretation of experience at large. Its truth is not to be tested by a crucial instance, for it does not assert a law which can be demonstrated by being brought within the range of experience itself.

Metaphysics deals with realities which one can only see reflected in the facts of the world, as one infers a purpose in rational human conduct but can never establish its existence as that of any phenomenon may be demonstrated. Science, on the contrary, repudiates the conception of inner consistency as a point of method, and depends upon verification as its technical procedure. The ultimate appeal is indeed to consistency, but neither to the formal consistency of deductive logic nor to the metaphysical consistency of philosophy. The consistency of science is conformity of the conception to individual fact. Inner contradiction is eliminated by the progressive modification of theory until such congruity is attained. The hypothesis is applied to the historical order of experience and validated by the occurrence of events in such order and relations as its form requires.

Eliminate contradiction, says philosophy, and make your thought self-consistent. Eliminate errors of observation and induction, says science, and make your report conform to fact.

Philosophy, it may perhaps be said, treats experience as a fixed or eternal system. Science regards it as a progressive development in time. Metaphysical speculation constitutes a pure comment upon experience, whose situations it can neither interfere with nor develop. Its scheme of things exists only as an eternal moment in the imagination, for no turn of the wheel will ever bring uppermost the system of realities which it indicates. Were the situation to shape itself thus for the scientist, his mode of solution, though not the system of concepts to which it leads, would become identical with that of the philosopher.

As his problem actually formulates itself, however, the scientist finds himself able to make just that appeal from which the philosopher is cut off. The hypothesis is more than a logical comment upon the situation by which he is confronted. Since it is a theory as to the form of succession involved in phenomena—a theory, that is to say, concerning causal and genetic relations—it is in principle always possible to test its validity by comparison with the course of experience. It asserts something which subsequent events must present if the hypothesis be correct.

In this way, the consistency of scientific theory is universally demonstrated. It verifies each explanatory conception by demonstrating its conformity not only to the facts taken into account in its formulation, but to that larger historical system which constitutes the full reality involved in the problem; since the subsequent development of events must be interpreted as expressing this fuller situation. It is as if the metaphysician were to draw the veil and, by showing us the *Ding an sich,* demonstrate the truth of what he asserted about it.

The principle of experimentation may be called direct, in that the cause which science indicates appears within the limits of experience and is not simply reflected therein, as is the case with philosophy. The causes of events to which it points are themselves events. The bases to which it reduces phenomena are likewise phenomenal. It treats its material, whether physical objects or consciousness, in terms of its own constituents. Objective realities which are themselves to be found within the limits of experience we call phenomena. Science, therefore, may be described as the procedure of intelligence in its treatment of phenomena as such. The scope of this procedure is limited only by the bounds of experience, throughout whose field its general methods and criteria remain unmodified.

Another distinctive characteristic of science follows from the nature of this regulative concept, which also sets it off from philosophy. To treat reality as a system of phenomena is to conceive it formally and not in terms of its significance. It is to regard it as a system of objects to be described, not as an experience to be interpreted or appreciated. In short, the point of view of scientific procedure involves the conception of mechanism and genetic development as that of philosophy assumes teleology and value. Science explains the event in terms of its origin and cause; philosophy interprets it in terms of its end or significance. The concept of meaning is irreducible in terms of science. The latter regards the fact solely as an element in a determined series. It must, therefore, wholly resign the conception of tendency and express its results in terms of historical antecedence and causal relation. The function of science, in any given class of facts, is to determine the form of their occurrence and to express it in an abstract law.

In terms of such formulae, the relations of every class of phenomena must be expressed; and the range of science, in respect to phenomena, is universal. It touches but one aspect of reality, but all forms of reality known to us possess that aspect. There are, of course, other concepts under which the whole of experience may be treated; but these differing conceptions do not divide the realm of experience between them, the one having sway as a regulative principle in our explanation of this group, the other in our explanation of that.

The world of consciousness, for example, must not be reduced in terms of a set of concepts ultimately different from that in which the changes of the material world are stated. Both are historical processes, and are to be explained only in terms of time-succession and under the concept of uniform causal relation. Human conduct must be statable in the same general terms as the motions of things, the forms of chemical synthesis, the processes of life, if it is to be included within the domain of science. Each element must be conceived as part of an orderly process the successive phases of which arise in such a way as to make their occurrence predictable if the full status of their antecedents be given. That facts can be treated thus is the basis of all understanding. New phenomena cannot appear out of relation to antecedent events if knowledge is to exist. Science is a study of origins, and that for which a cause cannot be predicated is miraculous. It lies outside the limits of intelligible existence. To be a fact is to have a cause: this is the necessary assumption of historical science, and its work is the systematic development of the relations between facts and their causal antecedents.

To confuse this fundamental point of view, which both defines the field of science and regulates its method, is to misconceive the function of explanation as well as to obscure its limits. In the general treatment of experience, science has a specific office to perform which can never be transcended, a limitation which applies to the study of consciousness equally with that of the material world. It is bound by assumptions which it cannot criticize without ceasing to be science. Concerned with one special aspect of reality, it must ignore all others. Whatever its subject-matter, science conceives it as a complex to be resolved into its elements, the form of whose combination is to be expressed in terms of causal relationship. This is but one aspect of reality, and implies a dissolution of the bonds of experience; for it involves the substitution of a system of abstractions for that concrete reality from which the inquiry starts. But this is rendered necessary by the very assumptions of science, which are determined by the specific nature of its undertaking.

The violence done by this diremption of reality is most acutely felt in the treatment which science accords to consciousness; for there, as nowhere else, the facts with which it deals are originally given as immediately significant experiences. Nevertheless, the psychologist's conception of the world of subjective reality as a sum of facts is no more artificial, involves no more real ignoring of inner significance, than the method of chemistry or of physics. The procedure, too, is as fully necessitated in the one case as in the other. To approach mind from the scientific standpoint is to conceive it in its phenomenal and causal relations. Just as psychology can never present us with a picture of that living reality which we know immediately in every moment of significant life, but only with a system of fixed and static elements, of discrete successions in time, of abstract and formal laws: so also is it precluded from interpreting either facts or life in terms of their ultimate values.

The hope of an epistemological contribution is perhaps more natural in the case of the mental than of the physical sciences, but it is no less specious and misleading. The material to be interpreted by philosophy is the whole system of phenomena which experience presents, whether subjective or objective. The discovery of a new fact, or the determination of a relation among facts, extends the data of experience to be taken into account in the epistemological or metaphysical problem, but it adds no iota to its interpretation. No fact or scientific law has logical relation with any metaphysical concept; it is philosophically indifferent.

The theory of evolution, for example, was first interpreted materialistically; because that philosophical tendency, being vigorously active at the time of its promulgation, seized upon and developed the new theory in terms of its own presuppositions. At the same time, those who were not of that metaphysical habit of thinking, mistaking the relation between these two problems of knowledge, at first relinquished the evolutionary hypothesis to their adversaries. A later generation corrected the mistake. Similarly, a misconception of the applications of scientific method is involved in any assumption that, by an empirical examination of the facts of experience, the problem of knowledge itself can be settled.

Psychological analysis, therefore, can never afford an approach to the general problems of knowledge and reality. What the physical sciences do for the changes of the material world, psychology accomplishes for the phenomena of individual and social consciousness. It explores the general field of mental life and brings its facts more fully to light than any observation determined by purely practical motives could ever hope to do. It restates these facts in terms of elements which are not themselves forms of experience but abstractions which have been devised by the intelligence in its function of analyzing and describing these mental facts. And finally, it formulates a system of laws, a conceptual scheme, in terms of which the relation of these elements and their syntheses may be expressed.

Every aspect of this significant life, simply because it is an experience in time, offers itself to such psychological treatment. If, for example, the individual mind be thus approachable, the social mind cannot be excluded because of the gigantic theatre on which it acts or the multitude of facts it embraces. The reactions of any complex nature are difficult to trace, whether it be individual or social; and, though such empirical obstacles delay advance, they cannot invalidate method.

But neither can the human significance of any experience exempt it from psychological attack, since in no case is the science in direct touch with this aspect of reality. There is moral heroism in any adherence to duty in the face of temptation. But there must just as truly have been a situation which can be psychologically described. Any such experience presents a complex system of stimuli, partly tending to break down, partly to reinforce, the reaction which occurred: a past life in which occasions generically similar were met in ways having a definite influence upon the present outcome;

and a decision, occurring at a certain point in this complicated stream of thoughts and feelings, which was expressed in something done. It is just the discovery of these aspects of the situation which psychology seeks.

In our understanding of the activity or development of the religious consciousness, psychology has a like service to offer. The religious life is part of human experience, and its mystical values must not be confused with its existence as fact. Since all human experience is significant, the most commonplace act would be excluded from psychological treatment equally with religion if this criterion of limitation were to be applied. Psychology is the natural history of consciousness, and anything which has an historical existence may thus be described. It is the very aim of psychology to bring to light the inner richness of the materials of spiritual experience in all its phases, whether religious or moral, theoretical or practical. The complicated texture of these materials an untrained observation can scarcely begin to imagine; but it is nevertheless just the common life of intuition itself viewed under a specific technical method.

The product of psychological analysis and reconstruction is thus not another system of reals, whether within or beyond the field of consciousness. It does not, so to speak, disabuse us of illusions and put us in possession of reality. It does not show us the true nature of our mental life, as something of the same order with immediate experience but more permanent or valid. One comes to know oneself better as the result of psychological study, but not through being brought face to face with a deeper and hitherto unknown self. The mind of which the psychologist speaks is not a life but a system of conceptions which are applicable to life, and serve to describe that single significant unity of conscious experience which is the only reality we know.

Nor does phychology provide us with a system of reals lying beyond the limits of consciousness. Its laws are applicable only within the field of experience, of which it expresses the uniformities of coexistence and succession. Its whole product constitutes merely a part of the datum which is to be interpreted epistemologically and metaphysically. The latter forms of synthesis it does not itself at any point touch. They constitute a set of problems left over after the psychological study of mind has been completed. The development of exact method within the latter field, and the systematic extension of psychological law, can serve only to render more distinct the scope of the two fields of inquiry, and to make us increasingly sensible of the necessary limitations of psychology in the system of knowledge.

# CHAPTER VI

# PSYCHOLOGY AND THE SELF OF INTUITION

THE technical aims of reflection are highly specialized; and its intellectual products have a certain remoteness from the range of our immediate interests, which often occasions difficulty in understanding their nature and values. This liability to confusion is increased by a community in popular and scientific forms of expression which, while it may be undesirable, is at least an inevitable feature in the general development of thought. Reflection springs from the vital issues of existence, and, at all levels of development, finds its ultimate justification in the practical contribution it makes to their solution. Only in its higher stages are an independent aim and residential element of value methodically asserted, in a formulation of the conceptions of pure science and a theoretical interest in truth.

This attitude of detachment a certain type of mind finds hard to comprehend. In consequence of this lack of imagination, the realities of intuition and the objects of practical life continue to be the point of reference with which scientific conceptions are compared. To one who is thus accustomed to think in terms of the active and moving forces of life—to have regard only for motives and values—the conceptions of science seem not merely to be marked by an exaggerated precision and simplicity, but to be a schematic and artificial travesty of their originals.

All the objects of the practical will have substantial existence. They are sensibly or, at least, individually real, having specific qualities which give to each its place in a world of values. It is this preferential reaction, with its hierarchy of products, in which the will is fundamentally expressed. From this point of view, an interest that ranges over the whole field of phenomena and finds nothing trivial, shows a disturbance of the sense of proportion; and a mind that does not linger over the flavor of an experience, but penetrates habitually to the question of its connections and causes, seems to have lost touch with reality.

Something of this sense of alienation in the scientific point of view appears in connection with our representation of even the most elementary forms of life, where it imparts a feeling that the system of conceptions with which biology works is inadequate to represent the existences it treats. That complex of internal relations which gives to each organism an active unity, is the essential fact upon which we seize. Each creature is a living thing, an individual having character and integrity. In this way, inanimate objects themselves are frequently conceived; but it is within the organic world that it becomes our habitual form of reaction. In technical biology itself, as already pointed out, this attitude has found representation in the demand for a recognition of entelechies, or resident and directive forces, among its working concepts.

Now, in each case, science resolves its object into elementary structural units and specific receptivities for stimulation. It thus makes of the organism a mere locus of impinging forces, not, indeed, in the sense that all unique quality is denied to the thing, but in making the variety of stimulation to which it responds the systematic ground of explanation. That is, each thing, as treated in science, is definable in terms of its characteristic reactions under a standard series of experimental conditions.

This process simply reverses the intuitional point of view, which initially apprehends the thing as a unity, and construes the conditions under which it exists, or the stimulations it receives, in terms of their significance or value for the thing affected. In the world of immediacy, the viewpoint of reflective analysis is unknown. For the subject of intuition, individuals, cannot be resolved into mere series of reactions, even when their nature is elementary, but must be treated as significant integers.

Especially is this true when the level of human existence is reached, and the methods of reflective analysis are applied to its materials, in the science of psychology. For here the basis of all intuitional treatment of reality is confronted in the immediate form of self-existence. In this field, unity is not a regulative concept and value an ascription; they are the immediate data of consciousness itself. Reality, for each one of us, is just this system of active relations which we maintain with a significant world. It is manifested through the preferences we express in vital reactions, through the aims we formulate as experience develops, and through the reorganization of those plastic materials which the world affords in the service of ideal aspirations.

Of this conscious active life—which, for each one of us, is a significant spiritual existence—psychology undertakes to give an account, setting forth its constituent factors and their essential relations, examining the conditions under which representative expressions occur, and tracing the genesis of the individual mind as a specific system of mental characteristics. But, in so doing, the deficiency of this conceptualizing method, upon which reflection at large proceeds, is most keenly realized.

In relation to lower forms of life, and in its treatment of the physical world generally, no vital issue is felt to be involved in this mode of approach, and its practical values outweigh all sentimental considerations. It is different with human life and its treatment. Spontaneous energy and self-direction are felt to be the centre of gravity of this whole system, which must not be disturbed. Intellectual apprehension with its illuminating reactions and sense of universal scope; the sensitive response of sympathetic emotion, giving the impression of an almost literal projection in its outrush toward other selves; the affirmative decision of the will which feels the very earth move under its initiative: these realities of intuition, which are the breath of life in individual existence, find no representation in the product of psychological analysis.

But, by the very conditions of its own method—in which psychology conforms to the nature of science at large—the recognition, among the facts with which it deals, of any central unity in mental life is excluded. Its object, if it is to be treated at all, must be analytically conceived: as a sensation-complex, a compounding of images and feelings, a series of reactions to stimuli, and the like. The conceptions in terms of which physical organisms and material substances are reduced, must be applied here also. Psychologically the conscious self is to be defined solely in terms of a series of characteristic reactions under a representative system of stimuli the form of which is expressible in discrete laws.

The psychological conception of the mind, however, is but one of several ways in which the activity of the self may be regarded when the question of its relation to a systematic ground of reference is raised. Before the nature and limits of that conception are taken up, these more general distinctions should be reviewed, and the modes in which they affect the treatment of mind pointed out.

The study of any subject-matter may be approached from a variety of standpoints. Each inquiry is guided by a specific purpose which determines the conception of its data as well as the nature of the conclusions to which it leads. This multiplicity of viewpoints is the source of errors which must be guarded against in discussions of the methodological postulates and limits of any science. In the history of psychology, a notorious instance of the failure to observe these logical distinctions is to be found in the confusion of metaphysics and descriptive science which underlies the historical transition from rational to empirical psychology. In contemporary discussion, the conception of data and criteria is exposed to error from a similar interpenetration of principles.

The mental life may be considered from three points of view, the practical, the scientific, and the philosophical. The first inquires concerning the immediate uses and direction of the mind; the second, concerning its structure and development; the third, concerning its metaphysical significance. The practical student views mind as an instrument; the scientific, as a phenomenon; the philosophical, as a real. The first is interested in its external relations, to things and other individual minds regarded as ends of the practical intelligence. The second is interested in its internal relations as an organic system having a typical form of activity and in its historical conditions as a development in time. The third is interested in its relation with ultimate reality, and inquires concerning its place in the universe as a whole. For practical purposes, the individual mind is plastic material to be moulded in adaptation to an end. For the scientist, it is a class of phenomena to be understood in terms of empirical relationship. For the philosopher, it is a system of rational activities and ideal purposes to be interpreted in terms of their absolute values. The points of view and aims, the methods of treatment and resultant products, are unique in each of these several ways of regarding the mental life.

In one sense, the practical man is not interested in the study of mind at all. His object lies wholly beyond its circle in some change which is to be brought about in the external world. He wishes to sell his merchandise, to obtain good service, to modify social judgment, to secure political victory, or the like. In the attainment of some practical ends, other human minds are not involved in any direct way. One deals only with physical materials, as in raising vegetables or making a chair. But, in most of the things at which one aims, other human wills must be considered. The end is to be attained only through their mediation. One needs their assistance or must overcome their objections; that is, they appear as necessary instruments or as accidental obstacles in the accomplishment of a purpose. They are to be informed, taught, trained, encouraged, assisted; or they must be persuaded, convinced, circumvented, or defeated.

In all their more significant forms, our ideals are thus incarnated through the mediation of other human wills. The character of these wills must, therefore, be considered in our plans. To misunderstand them involves failure, because our object can be attained only by allying, transforming, or overcoming them. Though we may have no interest in these minds as such, either as systems of phenomena or as purposeful and idealizing selves, yet we must take them into account in our reactions, and thus to take them into account involves understanding them. We must apprehend both the present point of view of the mind with which we deal and its permanent habits of thought and feeling, if it is to be successfully directed or utilized in the furtherance of our aims. A knowledge of men, we say, is essential to success in the world of affairs.

In acquiring this knowledge, nevertheless, attention is not turned to the mind involved but to the end to be attained, as the fencer gains skill not by regarding sensations and movements in the arm which is lunging or making a parry, but through fixing his eye upon his adversary and countering or responding to each motion he makes. The mind is not first studied in isolation and the principles thus acquired applied in subsequent dealings with it. Knowledge springs from actual conflict with other minds in the pursuit of the ordinary business of life. While it thus becomes necessary to study these minds, the examination must be carried on as part of the conflict itself. It is a study determined, as to its form, by the requirements of the moment, and, as to its degree, by the significance of the practical motive which prompts it. Such knowledge is never an isolated system of truth, but, in its very origin and interpretation, is unified with a system of ends. Never abstract, seldom formulated and then only in a proverb, practical experience represents, from the outset, an essential unity of understanding and application, of knowledge and purpose.

On the other hand, in so far as each moment is dominated by a specific practical demand, there will be studied only that feature of the mind which has significance for this ulterior purpose; and, as progress is made toward its realization, the characteristics of mind which come into review may shift in a wholly illogical manner. Thus no opportunity is afforded to develop any characteristic systematically in its relation to the rest, no leisure, in the pursuit of practical purposes, to undertake a rational study of the mind as a whole or of any individual aspect or function of it.

Practical experience gives a series of vivid impressions of the minds we encounter but no systematic knowledge of their structure. It requires alertness, shrewdness, a capacity for swift intuition of the mental attitude and its bearing upon the matter in hand; and it tends to the cultivation of a mind full of useful maxims, vigilant, retentive of impressions, and instinctively wise in the conduct of affairs. For adaptation turns not upon a consistent view of human nature in its integrity but upon specific information and the ability to respond with a definite reaction to each situation as it arises.

The knowledge gained through active participation in experience as a system of ideals and materials for their realization—the education of life, as we call it—has both excellences and defects characteristic of its origin. It is a knowledge won through activity and determined by utility, but it is essentially fragmentary and unsystematic. Practical knowledge of the mind is not the outcome of a consistent attempt to understand the phenomena with which it deals as a whole. In the last analysis, therefore, it provides an insufficient basis for even that adaptive reaction which it served originally to make possible. Its content is made up of those individual items of information which have been found useful in the attainment of practical aims.

There is a conception of the mind, likewise to be included within this first category, in which the treatment is not instrumental to an extrinsic aim but regards the mind as an end in itself. It is that form of study which is involved in educative discipline and direction. Here, then, is an instance in which it would seem that interest centres in the mind as such, and that the latter may be called the immediate object of study. In this case, the essential assumption is indeed the significance of the self's development as the subject of experience. The training of the mind may be called a means to an end, but its discipline and culture are not of this nature. They rest upon the conception of personality as a subject of worth in itself, though they may involve other things as well, such as the functional contribution of the individual to a system of social ends. Educational interest may thus be said to centre in the nature of the mind itself and to seek, in its study, nothing beyond that mind.

Nevertheless, the locus of interest in education lies not in understanding the mind but in bringing it to its full realization. The determining conception is to be found in that ideal system of functions and attitudes which the fostering intelligence seeks to develop. The mind as it comes under review by the educator, whether parent, teacher, or priest, is thus conceived in relation to an ulterior reality; and its study is, after all, instrumental to the purpose of attaining a practical end. In neither utilitarian nor educational attitudes is the system of mental processes as such the object—the final object—of study.

In the scientific treatment of mind, it is just that complex of phenomena, as presented to observation, which is under consideration. In its view, the individual mind is neither something to be reacted to and made use of in the give and take of vital experience, nor is it a reality which must have place and significance in the sum of things. The scientist is concerned neither with utilitarian modifications of the mind, nor with its ideal valuation, nor with the metaphysical interpretation of its existence. As subject-matter for science, it is a system of materials and processes definable in terms of the qualities and forms which they manifest, but belonging within the general field of describable relations which phenomena at large present. The aim of the psychologist may then be defined as the explication of the content and relations of consciousness as a process in time.

This, however, is not sufficient. The system of regulative conceptions under which mind is to be viewed must take its character from the technical purposes of the scientist and from the way in which, as a consequence, the object of his study is to be defined. The field of descriptive knowledge is, in general, that system of intelligibly related fact which we call the world of natural law. On the existence of orderly processes, its possibility is founded; for only such a world can be construed in terms of logical concepts. Anomy, chance, caprice, are terms by which we mark the absence of those conditions which make science possible. This representation of the world as a system of orderly phenomena is, of course, the condition of all rational conduct as well as the prerequisite of intelligibility in the object of knowledge.

Of all the fields to be explored by the scientist, there is none in which intelligible order holds a more significant place than in conscious life. It is the general subjection of its materials to ideal synthesis which gives to human existence its characteristic form and value. Mental life is a unity of functions. Whether a single attitude be considered or the synthesis of successive experiences, its fundamental quality is to be found in the system of significant activities which it constitutes.

The consciousness of any moment, for example, manifests a unity in the midst of its obvious complexity of make-up, which can best be exhibited by contrasting it with the essential discontinuity of two individual minds, however near their approximation in content and environment. Each moment of experience, in the second place, stands in intimate relation with that which precedes and that which follows it. As the content of any moment forms a complex within which no element can be modified without affecting the significance of the experience as a whole and ultimately of every other element within it, so does the content of each moment enter dynamically into the succession of complexes which constitutes the time-form of individual life. Memory holds this series together in its retrospection, and gives an added significance to each event by its reference to the system thus imaginatively reproduced. This system of associated experiences, in the next place, maintains connection at each moment with the objective world with which it enters into significant relations both by way of adjustment to its changes and by modification of its course. The adaptation of means to ends which the mental life presents, finally, is the expression of a system of rational purposes and ideals which give to experience that consistency and value in which its significance rests.

Human experience is thus not simply a succession of phenomena, of events in time; it is a unity of functions manifested in an orderly and rational process. The mental life is an expression of ideals of law and order. Continuity and rationality are as essentially presented by its materials as by the system of external phenomena. The relation of order and law to the content which is organized under these forms of the mind, is, however, unlike in the two cases. Unity and rationality are attributed to the external world; they are experienced in the inner order. The unity of the outer world is either a logical concept or a metaphysical postulate; that of the self is a reality of immediate experience.

The phenomena of the external world appear to us as causally determined events. Whatever aspect of significance they may have, necessarily escapes the observer. If there be a world-subject—as the self is a subject—which gives to these phenomena a unity and value, it is at least not a reality for our experience. Such unity as we predicate of the phenomenal world must arise from the synthetic activity of our own minds in construing these events. It is attributed to that world as the logical condition of its existence as a system of phenomena. In other words, it is solely a methodological postulate.

The unity which we predicate of the mental life, on the other hand, is not thus logically conceived and referred to a system of elements presented as a mere succession of events in time. Unity is an immediate and indefeasible reality of our experience. It is a fact—if that of which one is thus immediately aware can be called a fact—whose existence is neither posited nor inferred, but intuited. We may thus say, without reservation: There *are* meaning and rationality, law and unity, in the mental life, because we find them there.

The mental life, therefore, seems to present, in its essential form and value, just those characteristics which must be possessed in order that any subject matter may be susceptible to treatment under the general conceptions of science. Yet it is just in this regard that the scientist finds his way closed. The limitation imposed by his point of view appears within the fields of physical and mental science alike.

The methodological unity in terms of which the external order is construed can never become an object of descriptive science. It is not a fact among facts, a phenomenon which can be isolated and regarded apart from the system of things to which it gives unity. It is not a relation among things, whether of coexistence or succession, of cause and effect, or of dependence and support. Nor is it a law expressing such relations in their most general form. As science deals only with facts and their relations, which it expresses in terms of concepts and laws, the metaphysical unity which is apprehended in connection with our intuition of the external world can never become an object of scientific treatment. The unitary and significant reality which metaphysics postulates, necessarily appears as a series of phenomena, to be formulated in terms of abstract units of constitution which in turn can give rise to nothing but a system of conceptual laws.

The unity of the mental life, similarly, lies beyond the reach of scientific treatment. It is a reality for which the terms "Self," "I," "Person," and so on, are expressions—the origin, for each of us, of all such rationality as we find reflected in the world of experience. It is this unity of the self which makes every part of life significant and gives it value as a whole. It is in its service that the world of experience arises, that its phenomena are studied and their laws formulated, that its materials are transformed and organized under ideal criteria, that the world is conceived as a rational whole.

In this sense of unity and value, the self is universally expressed. It functions in every conscious perception and act. To the one, it gives rational significance; to the other, purpose and meaning. It defines and directs, inspires and energizes, subordinates and organizes. It is the unity in which alone each element of the mental process finds meaning. The self is related to the individual elements of the mental life and to their sum as the soul's relation to the body has been expressed: it is all in the whole and all in every part. No mental activity exists which does not manifest it. No analysis of experience will ever bring to light a mental event in which it is not postulated.

This principle of subjective unity must be recognized at the outset. Self and event are elements in a single reality which we call an experience. In abstraction from its correlative, neither of these has existence. The experience must exist for a self, the self be realized in a succession of experiences. It is under the conception of self, in this meaning of the term, that all mental facts are treated. Of floating psychical phenomena, that is, of facts not given to a subject, we know nothing.

In psychology, therefore, as in practical life, the conception of self is the ultimate reference in every individual constituent. It expresses the final unity of the system of phenomena with which reflection deals, as, in immediate intuition, it constitutes the unity of experience for the real subject. But, in this sense, it is not a phenomenon which can be treated in terms of its relations in a common universe of discourse. The self is the *summum genus* of the psychologist, the theoretical concept which expresses the necessity he finds for a common reference in all the phenomena to be considered. Every mental fact is the experience of some self; it is part of the context of a mental life. But, within this field, each experience of the self, as conceived by the psychologist, must become an event in an historically conditioned series.

It is in this sense that the term is used when we speak of self-existence as something that can essentially be given in a single experience. I am aware of my own existence, we say; I am conscious of myself; I know myself as a subject over against that with which, as subject, I deal in any moment's experience. These phrases are part of common speech, and carry an important meaning. For the psychologist, however, it is not their practical or metaphysical value which is to be considered, but solely the nature of the specific fact which they interpret or express. If the awareness of one's own existence be a phase or element of experience, it should be possible to point to the occasion when it arises and to say what kind of experience it is in which the self is thus immediately revealed.

To this, in such a case, it is answered that every individual experience reveals it. I can be aware of nothing without being aware, at the same time, of myself as knower. I can suffer no pain and enjoy no pleasure without being conscious of myself as subject. I can desire nothing, seek nothing, regret nothing, without postulating myself as the subject of these attitudes of will. The sense of self accompanies and grounds all experience.

But, thus conceived, self-consciousness is no longer a fact among facts. It is not an experience which can be differentiated from others, and studied psychologically. It is equally given in all experience; yet it is not a constituent of experience as is sensation, for instance, or affection. It cannot be made more clear by dwelling upon it; for it does not rest upon a specific content which may be seized and held before the mind. In short, it can only be described as the immediate and irreducible reality which is itself self-existence. If there be anything that is metaphysically simple, it is this, the universal form of subjective reality. When used in this way, therefore, the term "self" means nothing more than is implied in the phrase "conscious fact." It is simply the postulation of selfhood as the formal condition of all mental phenomena.

If the term "self" be used to stand for the system of related characteristics and activities which psychology studies, it has a meaning and value for that science. If it stand for a specific form of experience which can be pointed out in any individual mental life, it may be approached by psychological methods. But, as the universal and necessary ground of reference in all individual experience, it does not properly fall within the psychologist's field at all. The barren reassertion, in connection with each fact discussed, that it is the experience of a self, adds nothing to its treatment; and the indication of this relation should appear in that preliminary definition of the field of psychology which must always be carried in mind but needs no subsequent repetition.

There is one class of cases, it may be pointed out, in which these two points of view meet and in which the subjective unity of experience is projected into the outer world of discrete phenomena, not as a mere logical postulate for reflection but as an interpretative basis for the practical reactions of the will. The mind of another person, however it may be known or presented to him, is not immediately experienced by me. Neither as a systematic unity nor as a momentary self-feeling is it thus given. What is known, and what alone I can observe, is that variety of physical facts which I call expression, speech, gesture, posture, movement, and so on. They compose a succession of bodily attitudes and reactions, now of one complexion, then of another, now occurring in one relation, then in a different one. My observation of the facts in question—all, namely, which I have in mind when I speak of the expression of character—is disconnected, partly because of the intermittency of attention, partly because of the obscurity of many factors of the series.

As impressions, these data contain scarcely a hint of that unity which they possess for my mind when I conceive them as the characteristic expression of a self. They are neither contiguous nor correlated; they occur as discrete happenings; and what is involved is, qualitatively, part of the world of sensible objects and events. They are not even the *disjecta membra* of a self, such as the events of one's own life would be were one to conceive knowledge of self to be the product of logical reflection upon experience instead of an intuition given in that experience itself. Before we can approach the problem of a self objectively given, we must construe each complex physical change in terms of a mental correlate to which we attribute it. We must, in other words, conceive it as the expression of a particular mental attitude. Thus construing it, we ignore the objective character of the reactions and deal thenceforth with the subjective attitudes implicated, conceiving the various acts as members of a common system of expressions, the manifestation of a particular self.

The conception of a self, in all such cases, is an interpretative attribution—though not a reflective formula—by which meaning and unity are given to a disconnected series of acts. We do not, of course, rest with the postulation of a bare principle of unity, but proceed to reconstruct, from these fragmentary data, the specific characteristics of the self in question, and even to predict the form of expression to be expected in the future.

In all this procedure, though the materials are presented discretely as scattered events and must receive formal unification, the conception of a self in such cases possesses more than a merely regulative value. It is not, as in science, an abstract synthetic formula according to which we unify a specific group of facts The result, therefore, is not a logical schematism but the predication of a real being. What we do is not to treat events *as if* they were the expression of a self, but to accept them as the manifestation of a self actually existing. Logically, in all our dealings with other human beings, the objective pole of our relation is such a self or real subject, identical in general character with our own being, though this attitude is never systematically maintained but alternates with a treatment of them as objective or instrumental material.

In the case of one's own experience, no less than in the interpretation of behavior in other men, the concept of self needs definition. The term may denote a unifying principle or a unitary being. It may indicate either the product of logical reflection or the significance of immediate intuition. Concerning its value for descriptive science, no question can well be raised. It has been used to denote a conception as indispensable to psychology as the concrete and dramatic representation of individual character is indispensable to our adjustment where the practical reactions of other human beings are concerned. But, in the case of each of these two specific contents which the term receives, we must consider what status and value it possesses in relation to the methodical aims of psychology.

Every event in the mental life may be conceived from either of two standpoints: in terms of its content and relations, or in terms of its significance and value. In the former case, it is treated as a phenomenon to be described; in the latter, as an experience to be interpreted and appraised. The description of phenomena, as has already been pointed out, is made possible only through their resolution in terms of a constituent unit. The interpretation of experience, on the other hand, is necessarily based upon the presupposition of a purposive and rational will in terms of whose ideals it is unified and receives value.

These standpoints cannot be combined in a single intuition. The event must be treated in terms either of its existence or of its worth; no middle course is possible. The two points of view are mutually exclusive. They represent different purposes, and result in products that cannot be brought within the same system. The one point of view is exemplified in theoretical interest; the other, in practical and moral activity. The former conceives the mental event as a problem for the understanding. The latter regards it as an object of the moral or aesthetic will. To conceive the event as a phenomenon is, in general, the point of view of natural science; to regard it as a significant experience in the life of the self is that of the real subject.

Personal experience is intelligible only when conceived in terms of a significant process in which, through reaction upon a conditioning and modifiable world, certain practical and theoretical ideals are realized. The primary aspect of all experience is this rearrangement of its materials in the service of an ideal order. The specific content of any such ideal must be stated in terms of the subject of experience and its demands, whether the organization be practical or sentimental or logical. The forms of organization comprised by the cycle of experience are thus never to be referred to objective determinants, such as the recurrences and juxtapositions which are to be found in their material elements. Every unity of experience reflects the synthesizing activity of the self, which is universally originative. To refer it to the unities of the world of physical stimulation is unthinkable.

Thus our perceptions, in which the phenomena of sense-impression are organized into a system of things, are not to be explained by any analysis of the field of sensation. Their demarcations and combinations cannot be expressed in terms either of the momentary correlate which they possess in the world of sense-impressions, or of the history of its constituents as elements in the past experience of the individual. Whether we consider the qualitative aspect of sensations and the logical resemblances and differences which they present, or the constellations in which they are grouped and the serial interruptions which mark their course, the result is the same. No adequate explanation of the forms of organization which appear in the perceptual world can be found in the connections and sequences which the field of sensations presents.

Memory, similarly, is not a reflection in consciousness of the order of past impressions. Neither its architectonic principles nor its function in individual experience can be referred to the uniformities of coexistence and succession in the field of stimulation, or to the order of impressions which they occasion. Memory is an originating and selective activity, which at each moment reorganizes the materials of past experience in the service of a present demand. It does not represent the content of an earlier moment or reproduce the actual successions by which experience was originally marked. All memory is synthetic and productive, as well when we recall those phases of past experience which are to be brought into practical relation with the present as when we give new organization to the materials which imagination affords in the service of some logical or aesthetic ideal. The distinction between reproductive and creative types is a discrimination in teleological relations and not in the ultimate nature of the processes involved.

The system of connections which our thinking presents at any moment, to take a further example, is not to be explained in terms of the so-called laws of association. The web of rational thought is no product of adhesion between contiguous ideas, no result of the frequency with which images have recurred together in past experience. As well try to explain the relation of hewn stones in a building by reference to the contiguity of rock-masses in the quarry, or the frequency with which pairs of blocks were laid side by side on the various vehicles which transported them. In proportion, one is tempted to say, as an individual mind is dominated by the historical successions in which its materials have been presented (by what we call the routine of past experience), the less will be its unity of theoretical organization and the less its practical efficiency in reaction—the less, in a word, will it be able *to think*. These, and all other forms of organization which the mind exhibits, must be referred to a wholly different origin, namely, to the ideals of the self and the system of purposes which its life comprises.

If, therefore, we require a key to the forms of organization which mark either the momentary or the habitual attitude of the individual self, it must be sought not in the system of materials presented but in the treatment which these materials receive. In a word, it is to be discovered in the characteristic reactions through which the attitudes of the self are expressed. That is a unity, for example, which (however it be made up) I treat as a single thing; and that is dual which I treat in terms of two distinct reactions, whether its constituents be more manifold than the former or less so. As the most generalized form of the self's reaction upon the world is the singling out of a particular complex of elements to be the object of the moment's conscious activity, this might be expressed by saying that that is a unity which is the object of a single act of attention. If we are to find a specific system of correlatives for the forms of organization which occur in our experience, we must seek it in the succession of acts in which we deal with the materials of experience, not in the character and relations of these materials as originally given in sensation.

But this must not lead us to regard the system of organic reactions as original any more than the system of impressions. The formal unities which the mind presents are no more a mere reflection into consciousness of the reaction or bodily attitude which the stimulus occasions than they are the product of the physical constitution of the stimulus itself. The latter concept, like the former, eliminates the subject from the equation, and makes mental organization the result of changes in the external world. It is thus wholly unserviceable in the work of interpreting the nature of experience. Under its application, the self becomes as purely a derivative phenomenon as when we attempt to describe the unities of experience in terms of the materials unified. The reactions in question embody principles under which the self has conceived the materials thus presented; they do not give rise to them. The reactions are secondary, not original.

It is thus evident both that we must approach the self through the system of reactions which constitutes its response to stimuli and that we must trace these reactions as flowing from, not determining, the self. How the sculptor conceives a block of marble appears in the figure he carves from it, as do the conceptions of builder, roadmaker, and geologist, in the respective modifications they produce. These characteristic reactions, it may be pointed out, attain their final status in human language, which provides a mechanism of analysis and expression in comparison with which all plastic embodiments through the organization of materials are but inadequate approximations.

The centrality of this conception is made clear by any examination of our ideal interests. Individual life is the realization, through plastic materials, of an active self which expresses its nature in characteristic and unitary ways. But the distinction between such a concrete unity as confronts us in this field and that abstract synthesis which the psychologist seeks, needs constantly to be redrawn, just because the former has primacy in experience and the psychologist himself slips only too easily into this habitual way of construing the materials of intuition.

It has been pointed out that any mental event may be treated in terms of either its content and relations or its significance and value; in other words, it may be conceived as a phenomenon to be described or as an experience to be interpreted. This opposition may be illustrated by the characteristic ways in which the general material of consciousness is treated under these two representative conceptions. From the standpoint of content, it presents a single continuous field of phenomena. Every experience has a material filling which can be described, and exists in historical relations which may be determined. Psychological treatment begins with an inquiry as to the specific nature of the mental fact by which the observer is confronted and its place in the classificatory system he is constructing as a means of grasping and understanding his materials.

This procedure—of identifying and classifying, relating and explaining—is made possible by the existence of similar elements in all the phenomena compared, which permits their reduction to a common basis. Irreducible differences cannot exist within a continuous field. Qualitative variations of course enter into any such system of data but not as the ultimate basis of treatment.

Classification is thus grounded in discrimination equally with assimilation; and, in science, the one must be pursued as systematically as the other. Differentiation is the means by which any field is broken up into smaller and more closely related groups. It is, therefore, involved in all identification of species and in all determination of causal relations. But the recognition of specific quality in the individual content of consciousness is never, for the psychologist, an expression of the unique flavor of intuitional experience. It functions solely as the elementary basis of those distinctions which must exist in any material if it is to be regarded as complex and subjected to qualitative determination. That is, in order to be treated by psychology at all, these qualitative experiences must be construed in terms of their association with correlatives, or dependence upon causes, which may themselves be treated as a continuous field of variations, such as a series of stimulus-magnitudes presents. This reduction is of course a postulate of science at large, not of psychology alone; but, in the treatment of mind, it becomes especially important—on account of the intuitive values of experience—to remember that, for the psychologist, the only unity which his materials present is that of intelligibly classified and related fact.

The differences which separate the various orders of sensation, visual, auditory, and the like, and those which appear within the limits of each sense, such as hues or tones, are called qualitative; but they serve primarily to condition numerical distinctions within consciousness. Discrimination turns upon specific sensory differences, call them variations in intensity, vividness, quality, extension, or what one will. Any two things must be unlike, whether they are objects in space or events in time, if they are to be distinguished. The specific nature of the difference is inconsequential. The immediately felt sensible unlikeness must be there if the field is to be conceived as numerically complex.

From the standpoint of value—the second of these regulative conceptions—experience is regarded in terms not of its material filling and historical relations but of its significance in some teleological system. Instead of being reduced to a common basis, the qualitative differences which it presents are accentuated and made absolute. From this point of view, mental life cannot be expressed in descriptive terms—as a series of sensation-complexes, for example, with their connections and products. It is the unity of a system of functions each of which must retain its individuality in order that their synthesis may be achieved.

This unity of consciousness is expressed in the word "self." Its constituents have traditionally been conceived in terms of three elements—Thought, Feeling and Will. Each of these makes a unique contribution to self-existence, which is penetrated by them as a mathematical system by its axes of reference. That is, any moment of experience may be described in terms of each of these components, but no such moment is reducible to any one alone. Feeling is never blind or passive; thought is never passionless or without result; action is never motiveless or objectless. Each term represents a logical resolution of the moment of experience in terms of a single conception. No one of these elements is chronologically isolable. They represent not states of mind but aspects of the inner life. The experience of any moment necessarily involves all three constituents.

The coexistence of these qualitatively different phases of mental life raises a new problem of unification; for, as thus construed, they do not constitute a single field of data, such as must be given in connection with the psychological object in all its transformations. They are not temporally dissociable, as are successive events; or mutually exclusive, as are objects in their spatial arrangement; or subject to logical redistribution, as is a series of tones or of concepts.

In order to bring these three aspects of the mental life into relation, one turns to the conception of their significance in the unity of functioning which that life presents. In the experience of a self, each of these phases has a characteristic place. Feeling gives value to experience; will modifies experience in the service of feeling; thought guides the will in its activity. Out of the domain of feeling arises the system of ideals which the mind possesses; will is the continuous attempt to realize these ideals; thought reveals the world as a system of means by which the ends set by feeling may be attained.

Thought is thus indissolubly joined with will on the one side and with feeling on the other. Not only does thinking lead habitually to doing; in self-existence it is the necessary condition of action. Pragmatically, it is a stage in the realization of desire. Happiness does not attend upon life like a shadow upon the movement of an object. It may be posited as the ideal state, that in which alone the self can rest; but dissatisfaction with an existing state does not banish pain or induce the ideal condition. One may be miserable and know no way of escape; as one may be happy—that is, find the state which exists ideal or pleasurable—without having striven for its attainment. Happiness and unhappiness describe positive aspects of the concrete consciousness, irrespective of the relations in which it stands to the process of transformation. The discomfort of a toothache is a fact, whether one know how to seek relief or not.

Further, when a representation of the ideal state takes place—as when one who has had experience of a happy condition retains remembrance of it in a later state of misery—its envisagement is a pure commentary upon experience in which it effects no change. The end sought by the will, in such longing, is not realized by any simple fiat. The situation is changed by some reaction upon the environment, not by the existence of inner discontent or desire for another state. There is always something to be done. That quality of consciousness which is represented as ideal is to be attained only as the consequence of an act or series of acts, terminating objectively in a changed world. To recognize an objective order and to exist in it means just this. The world is a system of reality which the mind does not create, which does not reflect faithfully the transformations in the individual consciousness. A pure objectification of the self's activities would constitute a mere dream-world, that is, a world which existed simply in virtue of the appearance in consciousness of a structure of ideas.

At the same time, the self finds the objective world plastic to its purposes. Neither is it the shadow of subjective movements nor are the latter simply a reflection of its fixed order. The world is a system of means which conditions the self's realization of its ends; and the modification of the objective system is followed by a transformation of the subjective state. The attainment of the whole system of ideal ends which life comprises—whether practical or theoretical, utilitarian or aesthetic—is thus conditioned by the use of materials which the external world affords; and its procedure must be subject to the order which that world manifests. To discover the uses to which materials may be put and to formulate the laws of this natural order is the function of thought.

At the outset of its history the self lacks all knowledge of the means to achievement. It is either unhappy without knowing why and without being able to help itself, or it is happy without referring its good-fortune to an object which it possesses or an environment which affects it. The dependence of its states upon such conditions, and the connection between means and end, it must learn empirically. This we call the development of experience.

The self must thus both achieve its own happiness and create the means by which this achievement becomes possible. This means is, in a word, knowledge. It is the product of that activity which we call thinking. The development of mental content is thus chiefly an elaboration of the process of thought. It is an increase in the understanding of the world and its relations as a system of means by which ideals of worth may be realized, the progressive enrichment of the apperception of the world as a synthesis of plastic elements. It is this fact that affords such justification as exists for the unequal distribution of topics in psychological discussion; for the largest constituent of all general works in psychology is cognition in its manifold aspects.

In the unification of feeling, thought, and will, which is thus achieved, the product is of a different order from that which appears as a result of their psychological treatment. The latter is a system of concepts which the mind has devised in the course of its attempt to describe subjective phenomena. Attention, association, memory, and the like, are not hypostatized and given an objective reference. Each is but a formula by means of which certain observations have been brought together or generalized. They represent the association-complex or historical connections in which the fact exists, and, for the psychologist, nothing more.

In the case of the self, conceived as that unity of functioning which gives meaning to the whole system of psychic elements—which not only assigns its place to feeling, thought, and will, respectively, but also constitutes the ground of reference in evaluating every specific activity of the mental life—no such descriptive generalization is intended. The self is not an abstraction but a concrete being. Its existence is not conceptual but substantial. It has an objective reference, not simply value for the synthesizing mind. Its essence, in a word, is intuitionally real.

Conceived in this way, the term "Self" does not stand for a system of subjective phenomena; nor are Thought, Feeling, and Will, empirically related facts in such a system. They are construed solely in terms of value, either through a reassertion of the immediate preferences of vital reaction, or on the basis of some specific metaphysical interpretation—as in ontological voluntarism or intellectualism. The constituents of the self, in this meaning of the term, have therefore no status as data for mental science, nor does their unity express those descriptive and genetic relations with which it is concerned.

The point of view which psychology represents conforms to the system of general criteria which empirical science involves. It deals with the world of subjective experience as a system of phenomena, to be described in terms of its elementary constituents or explained through the determination of its historical relations. The necessary abstractions of reflection reappear in the treatment of all subjective data. In psychology, as in the physical and biological sciences, only facts and their relations can be considered. The significance of the world, whether objective or subjective, is irreducible in terms of science.

If it be objected that, when thus conceived, mental states, singly or in successions and systems, are a mere abstraction, it need only be pointed out that they are such only in the sense that the atom of physical science is an abstraction (not a fact of experience); and that in exactly the same way the conception of a class or a cause or anything else is an abstraction—since it is a formulation designed for the purpose of description and nothing else.

Concerning the nature and use of both the ultimate unit and the final unity, in this abstract treatment of the mental life, dispute has arisen—that is, in regard to psychological atomism as well as the conception of the self. At the same time, the formulation and application of the intermediate series of concepts in this very system has been a matter of common and undisputed agreement. But it is to be noted that these are all equally abstractions, the proximate as much as the final. We cannot say sensation is an abstraction, but perception a concrete fact of experience; nor may we say association is an abstraction, but the psychological self an immediate reality. If, therefore, any such conception as mental state or mental element be helpful in describing the phenomena of individual experience, it can be no argument against its use to say that it is impossible to point to such states as facts of experience.

Whether concerned with physical or mental data, the aim of science is to formulate a system of laws which shall represent the relations in which the facts stand. It is for the purpose of making these connections intelligible and representable that all its concepts have been devised. In every branch, it has been pointed out, scientific procedure depends upon two general classes of concepts, the one of which may be called constituent, the other unifying. The first is the product of analysis, the second of synthesis. The former process is strictly instrumental to the latter; for to define a thing in terms of an element is the necessary preliminary to its expression through a synthetic formula. In these two ways we deal with the content of experience whatever its qualitative character.

This procedure has given us, on the one hand, factors, units, or elements; and, on the other, relations, laws, and systems. Both series of conceptions are indispensable. We conceive the object of reflection in terms of elements and the law of their combination. Each of these is an abstraction from the intuition in which it is presented. They neither are interpolated in the series of experiences with which reflection is dealing, nor do they exist alongside the latter as an independent system. The content of every object of reflection is thus conceived in terms of certain qualitative elements, and its structure is described by means of a synthetic formula which expresses the relation of these constituents.

The function of logical conception in the approach to problems of mental phenomena differs in no way from that which it fulfils in the physical and biological sciences. In psychology it is the facts of individual experience which are to be studied. To deal with these facts, a series of conceptions is indispensable. These conceptions are necessarily abstract; that is, they are not facts of experience but descriptive formulae conceived for the purpose of expressing the relations of phenomena. In psychology, as in every other science, the procedure of reflection also involves those two phases which we call analysis and synthesis. The result is necessarily some kind of element or constitutive unit representing the content, and some kind of law or unifying formula, representing its organization.

Both of these terms are relative to the nature of the facts involved, and represent all levels of complexity. By the term element, therefore, one does not mean the ultimate product of analysis, but only its proximate outcome; or, by the term law, some final unity which experience presents, but only the organic form of the facts in question. The unities achieved at a given level may themselves become the constituents of a higher unification; and the elements which inspection reveals on one occasion may themselves be subjected to renewed analysis on another. Thus the contents of a sensation-complex constitute the elements which are unified in perception. The content of presentation, together with that of memory, provides those which are unified in apperception. The incident impression or idea and that with which it was previously juxtaposed afford the elements which are expressed in the law of contiguity. The successive events provide those which are conceived in terms of causal connection, etc.

Whether science deal with any individual fact in the stream of consciousness, with the unity of any moment, with the permanent features of habit and judgment, or with the total complex which mental life presents, its point of view remains unchanged. Psychology can no more treat an individual fact of experience, as experience, than it can deal with the significant unity of individual consciousness as a whole. Each mental state is to be expressed, first, in terms of its internal relations. It is conceived as a complex presenting a problem of structure, which is resolved in the concept of a unit of constitution and a formula of organization expressing this system of relations. Each state, in the second place, is to be conceived as a unit having connections of dependence, support, and the like, with other elements and complexes of phenomena in a larger world, and therefore as presenting a problem of external relations.

Whether psychology deal with the self, then, or with the individual experience, it must treat its subject-matter as a system of phenomena, expressing its analysis in terms of a unit and its synthesis in terms of a law. In the proper sense, it is not the self which is dealt with in any such case, but an individual event alone. The starting-point is the unit of real experience. This unit psychology conceives as a complex whose constitution it must ascertain and formulate.

Out of these elementary abstractions is built up a series of concepts of increasing complexity or generality. These constitute the synthetic forms of progressively wider aspects of experience. The psychologist is bound to seek these forms throughout his whole field, to treat of conception as well as intuition, of reasoning as well as judgment, of character as well as apperception, of adaptation as well as imagination. He must describe the stream of consciousness as a whole and indicate the most general characteristics of the mind, just as he must analyze the content of each moment and establish the association-forms in which their elements appear.

The whole mental life is thus the field of psychology, in its grosser features and more permanent relations quite as much as in its minor details and individual characteristics. But while its province is coextensive with mental experience, it is still a single continuous field within which only one type of material is to be found, namely mental facts and their relations. The existence of these facts in a single connected system does not constitute a self, if that term be used to describe the unity of the real subject. Psychology does not substitute for the known self a reality of the same order, but corrected, rationalized, understood. There is but one unitary process of experience, upon which mental science makes simply an illuminating comment.

If these two meanings of self are to be excluded—if the psychologist is concerned neither with the assessment of immediate values in life nor with the metaphysical interpretation of experience—there remains the question whether the term is to be retained and what content is to be given to it.

In the first place, there is a specific meaning which may be assigned to the term "self" in psychology, as denoting something which the scientist is called upon to study among other particular mental facts. The sense of "self" is both a recurrent experience and an element of experience, though probably not universally or necessarily. As a recurrent event, while the sense of self-existence may not be a uniformly important constituent of experience, it is nevertheless a familiar fact. At times, either for practical or theoretical reasons or as the result of uncontrollable conditions, the self looms up in consciousness and engrosses attention. One is said to be *self-conscious.* The content and connections of such a sense of self vary greatly from occasion to occasion; but the nature of the phenomenon is not obscure, and its explanation involves no conception which the general treatment of psychological data has not already formulated. In such cases there is commonly an interruption of the orderly flow of ideas, a disturbance of both the vasomotor and the voluntary muscle systems, and an intensifying of the affective tone of experience. The ordinary network of sensations, images, and reactions, is thus replaced by a new and characteristic complex. But, while it constitutes a unique and frequently distressing consciousness, its make-up, as to nature, differs in no way from those other mental states with which the psychologist deals.

As an element of conscious experience at large, the sense of self is introspectively discernible in at least its major part and, as a constituent of mental life, may extend beyond the human subject to include the range of brute existence. But, in this sense, the term means no more than a dim undefined background of feeling which characteristically accompanies presentative and representative experience alike, and resembles more perhaps than anything else the vague sense of familiarity which penetrates our common apprehension of the external world. It is a vital constituent of experience for each one of us, yet little is to be made of it theoretically; it is there, it is to be noted, and that is perhaps all.

In contrast with both these particulate forms of experience, the word "self" has commonly been employed to represent the specific system of mental characteristics and activities which serves to indicate the concrete subject of experience and to mark him off from his fellows. In this sense, the term may not be very clearly or consistently defined, but it possesses—along with the closely related terms "person" and "individual"—an obvious value in expressing the most central and fundamental features of the mental life conceived as a unity. In this meaning of the term, we differentiate the adult self from adolescent and senile types, or extend the conception to its material and social analogues, or even speak of alternating, split-off, and subliminal selves. This use, on the whole, affords the most specific and acceptable meaning, which the term is likely to carry permanently in scientific terminology.

In the next place, the term "self" has been used, in an untechnical way, to represent the totality of phenomena with which the science of psychology is concerned. Its field is the mental life, in all its types and modifications, normal and pathological, developmental and degenerative. This system of data—the field of experience as subjective and individual—reveals an unsuspected complexity of structure and relationship as it is explored. Even the normal self presents a bewildering profusion of idiosyncrasies in individual habit and reaction, in qualitative make-up and affective tone, under specific stimulation.

When, from its original terms in the normal adult self, one traces the expansion of psychological interest which has taken place in the past generation, and notes even the mere quantitative addition to our knowledge of mental phenomena, the largeness of the task is first dimly apprehended. But one thing at least is forced upon the attention: that, in its actual inner variety, and in its subtleties of response or rapport, the features of the human mind are no more adequately revealed in the ordinary course of experience than is the subject-matter of any other science made known to those who may have to deal with its materials in a practical way.

The work of psychology in all its branches, experimental and theoretical, is directed to the development of that complex conception which reflects the rich and varied life of the mind. This life, complicated beyond representation in its characteristics and activities, subject to modification in its specific features by every incidental stimulus, undergoing progressive development with each successive experience and, therefore, explicable only in terms of its whole history—this self, as we call it, can no more be given to the subject in an intuition than it can be given to an objective observer. It is presented in any moment's experience merely in a certain phase, relation, or attitude. It can be known only through the whole succession of experiences which constitutes individual history; for its features are not given a priori, but must be learned empirically by the subject as by all others. In its fulness, it is the summation of all those individual characteristics which are determined through reaction to specific situations, the occurrence of which depends upon the order of the objective world.

The filling in of this picture is, in general, the task of descriptive psychology, and its subject is commonly called the Self. This use of the term is grounded in popular speech and in itself involves no inconsistency. Nevertheless, since the term is also employed with other specific meanings, it seems better to employ, in this connection, a term which is free from these secondary implications. Especially when the field is extended to include lower forms of life, it becomes increasingly apparent that the word "self" does not express with exactness what the psychologist intends to convey. It is because the term "mind" carries just this specific reference to the complex of thoughts, feelings, and actions, which individual experience presents, that it has obtained a secure place in psychological terminology as designating its general field of exploration.

These applications of the term "self" are to be sharply contrasted with that which expresses nothing but the logical limit of reference postulated in the definition of the science itself. The intuitional content of the term has already been discriminated from its scientific application. In the former case, we mean by the self the actual subject of experience. When I say, "The self is real," I mean thereby to assert only what is implied in the statement, "I am." In this sense, the self is neither phenomenal nor noumenal; for each of these terms implies a logical resolution of the manifold of experience. Or, it might perhaps be said with equal truth, it exists in both of these modes. The self has a phenomenal existence, the content of which psychology treats; and it has a noumenal significance with which metaphysics deals.

Though neither science nor metaphysics is concerned with the subject of immediate experience, it is the object of reference in all treatment. In psychology, it thus becomes necessary to mark the unity of the whole system of phenomena with which the science deals. In the first place, no mental activity exists independently; correlation is everywhere presented. The various mental processes mutually condition, modify, and contribute to one another; they form a network of connected functions. In the second place, through all the data of psychology runs a qualitative identity which may be characterized by saying that everything the psychologist touches must be conceived in terms of individual subjective experience. It must either be itself a fact of consciousness or be restatable as a condition or product of consciousness.

Now the term "self" has been used to denote this unity of materials and relations which must everywhere be assumed but nowhere becomes the object of treatment. It marks the field within which every inquiry falls. All psychology is the psychology of self. On the other hand, there is no psychology of selves which may be placed over against what may be called the psychology of the constituents of the self; that is, of the particular individual phenomena of the mental life. For everything which science treats must be conceived in terms of its relations to other things; and, while each of the special mental processes exists in a system of functions and thus affords a field for psychological treatment, the same does not hold true of the self.

It cannot be urged that the self must be susceptible to treatment as a unit in a larger system of things since social psychology exists. The latter can be differentiated in no way from individual psychology as regards either the nature of its subject-matter or its general conceptions. It investigates a special group of activities and products falling within the general field of psychological inquiry, namely, those which depend upon the fact that man lives in association with his fellows and that this mode of life gives rise to certain communities of thought, feeling, and action, which do not come into sight so long as one regards the psychological subject from a strictly individual standpoint.

These modifications arise like all others. They appear as reactions upon changes in the external world and introduce no new order of occurrences into the mental life. The only subject which is ever before the psychologist is thus some special mental event or process; and his problem is the determination of this activity in relation to the system within which it is found, through the establishment of its connections with other individual mental processes, or with those general objective stimuli by which they are equally conditioned.

## CHAPTER VII

## PSYCHOLOGY AND THE ARTS OF LIFE

IN the most general sense, all science has a common application; for there is nothing so remote that it may not have a bearing upon human action, and nothing so complex that analysis of its constitution or relations will not increase our understanding and control of it. The contribution of each science in this regard is specific, and its value must be considered in relation to that particular group of problems which it helps to solve. The applications of reflection are as manifold as the aspects of life itself.

The perception of this practical significance, on the other hand, is not involved in the discovery and formulation of theoretical law as such. When a sustained interest in the understanding of phenomena has once been aroused, the scope of inquiry becomes universal. It is no longer restricted to objects or processes whose practical importance has already been discerned, but ranges over the whole domain of empirical fact. Science represents the systematic attempt to determine and express the principles of change in this general field. If any process have no discoverable bearing upon the conditions of existence or action, or if it be not subject to control, it will exist as a pure object of contemplation. Intellectual interest will be limited to the act of understanding, since knowledge of its laws cannot be turned to account. But the intellectual problem will take on a new aspect if its relation to human action be modifiable through either a transformation of the objective order or a reconstruction in the subjective attitude.

The development of intelligence at large is reflected in the enrichment of practical knowledge in regard to materials or their uses, and in an extension of the system of theoretical concepts to which reflection has given rise. But it is even more characteristically expressed in the development of a sense of the vital relations which these two series bear to each other. This is manifested in the rise of a consistent attempt to deduce and apply the practical implications of principles which theoretical science conceives in a purely abstract way, and to employ experimental research as a systematic means of solving problems in the applied arts.

Adaptation in general depends upon a knowledge of the materials with which we deal, and upon an anticipation at each moment of the next step in the series of changes. One must in some degree know what to expect if conduct is to be adjusted to objective changes at all; and, the more fully the nature of any situation is apprehended, the more adequate will be the adaptation which results. Every inquiry into the nature of things, under these conditions, will have a double interest; for the value of knowledge, as a guide to practice, will be added to the immediate satisfaction of comprehension. But this concern with the applications of knowledge does not in itself imply any attempt at a general understanding of things, or furnish an adequate stimulus to its prosecution. Practical and theoretical interest are unlike in both motive and result. The knowledge which is sought, as well as the distance to which the inquiry is carried, differ in the two cases.

Practical interest is concerned only with the nourishment and defence of life; it is not attracted by knowledge for its own sake. But reflection is forced upon intelligence as a necessary means to the satisfactions at which it aims. It is indispensable to secure and prosperous living. The stimulus of practical interest thus serves to sustain inquiry only in so far as reflection is seen to be involved in the satisfaction of desire. Investigation is not carried on independently, nor is theoretical completeness its aim. Logical consistency has never been a virtue of the practical understanding; it seeks only the economic attainment of utility.

The basis of intelligent adjustment is the existence of a determinate order in events, and the establishment of the particular facts in question exhausts the impulse of practical interest in any given case. The result is an empirical knowledge of the connections among phenomena in their more obvious relations. It falls short of any searching analysis concerning the mode in which phenomena are connected and the principles underlying their occurrence, since in large part these connections lack all immediately discernible bearing upon the maintenance of life. The intellectual field of any problem is thus illuminated by practical reason at those points only where knowledge is indispensable to reaction; the rest is left dark.

Practical knowledge is thus full of omissions. At this stage in the development of intelligence, a lack of information is never disturbing to the man of affairs, if ignorance involve no practical penalties. The object of his deepest contempt is useless knowledge; and the restless search after truth which theoretical interest prompts, seems to him the distortion of a natural instinct, whose analogue is to be found in the fantastic forms taken by the collecting and hoarding impulses in abnormal individuals.

Theoretical interest, on the other hand, seeks comprehension as a practical regard aims at utilization.

For one, the world is an object of adaptive reaction; for the other, it is an object of intellectual contemplation. In the reflective treatment of experience, it is the internal relations of phenomena which are to be determined and formulated. Their characteristic effects, when they impinge upon the course of life, are usually secondary. Theoretical interest in the world is thus guided by a conception which is alien to the dominating idea of practical activity. It aims at a systematic knowledge of each class of facts concerning which inquiry arises. Causes, connections, consequences, relations of every kind, are of significance under the ideal of a complete determination of fact in the system of phenomena.

The attainment of this end is obviously impracticable. In its dealings with the world, logical reflection postulates unity rather than discovers it. The product of science may be described as a skeleton of structural lines penetrating, like spicules of crystal, the fluid infinity of the world. At every point, the phenomena which a new explanatory hypothesis defines are in contact with a greater mass of yet undetermined relations. The theoretical reason, like the practical, is thus confronted by an uncompleted task. But whereas, in the latter case, the logical development of this problem does not even fall within the circle of interest; in the former, it is the central and determining factor in the whole process.

For logical reflection, the universe is a continuous web of phenomena within which isolation is inconceivable. Every event is represented as part of an uninterrupted succession, at once consequence and cause. To determine the form of such interrelations and to bring to light every element of the associated system, until the world of change can be viewed as a consistent whole, is the task which man's theoretical activity has set itself. Explanation is the specific indication of relationship, and science stands for continuity of knowledge. Reflection, therefore, suffers defeat wherever a break is encountered in the system of relationships, and the task of science must there be undertaken anew; for it is a primary postulate of the intellect that the world shall be conceived as a single intelligible system. The historical development of science may be described as the construction of a material system of formulae which makes possible the treatment of phenomena in terms of this conception of unity.

Theoretical interest in the world and the conceptual systems to which it gives rise, need no defence. Reflection possesses an intrinsic, not merely an instrumental, value. Man cannot rest in a sensuous and brutish ease. There is a will to know as well as a will to live; and the one instinct is scarcely less continuous and insistent than the other. Mental confusion gives rise to a distress no less poignant than that of physical pain. A theoretical problem is an intellectual challenge which cannot be set aside. In this field, as surely as in those of use and beauty, man confronts a task imposed by his very nature: to create an ideal order out of the heterogenous materials which experience presents. And, here as there, it is an intrinsic good which is sought, the satisfaction that attends the solution of any problem of reflection. Knowledge, like virtue, is its own reward. The successful application of ideas to experience is the source of an immediate intellectual delight, in which reflection finds its own proper and sufficient end.

The sentimental value of reflection, however, is a late product of development, and in itself is an inessential aspect of its significance. The roots of thought go deeper and touch the fundamental conditions and aims of existence. Throughout the history of reflection, the cultivation of pure science has found its ultimate justification in the application of its discoveries to the furtherance of human good. The theoretical treatment of experience is an indispensable preliminary to all practical activity in its higher stages of development. It is scientific knowledge which makes possible the rational control and use of materials.

The science of mechanics, for example, is concerned only with a determination of the general laws of motion and resistance among physical bodies. But the shape of every girder and the thickness of every bolt, the proportions of buildings and forms of projectiles, are controlled by principles which the theoretical study of mechanical forces has made known. Chemistry, in its analyses, has no concern with the dye-stuffs and drugs, the foods and explosives, which are composed from the substances it studies. But sanitary diets, curative prescriptions, and beautiful fabrics could not possibly have reached their present development were it not for the knowledge which a study of pure chemistry has afforded.

On the other hand, it is true that, in the earlier stages of development, this historical order has commonly been reversed. The practical art of agriculture preceded by many ages the discovery of nitrogen-producing bacteria and their employment in the replenishment of soils. While still in ignorance of their function, husbandry even availed itself of the products of these organisms by under-plowing nitrogenous crops. Human emotion was uttered in rhythmical speech long before any idea arose of analyzing the structure of verse, or studying the means by which poetic effects are attained. Men traversed the sea, depending upon sun and stars for guidance, ages before the courses of the heavenly bodies were plotted and astronomy became the basis of navigation.

The history of all practical adjustment to the world begins with experimentation urged by pressure of the conditions of life; and its results are formulated at first in terms of purely empirical rules. But the arts of life have become rational and progressive in proportion as they have been brought into affiliation with a body of scientific knowledge and founded upon theoretical principles. Practice without science is blind. As it largely works in ignorance of the real nature of its materials, a method which is purely empirical must remain permanently halting and wasteful. In the selection of what is to be put to the test of experiment, it is dependent, at its best, upon observation of the external connection of events, without penetrating to the principles in which they are grounded; and, at its worst, empiricism is prone to have recourse to fantastic analogies, or even to make action turn upon the cast of a die. With an attention sharpened by need, it is quick to apply discoveries concerning the individual connections of experience; but its progress depends chiefly upon a succession of happy accidents, for in itself it contains no positive principle of advancement.

In the primitive stages of culture, practical misconceptions are discovered only through the breakdown of adjustment or control. The reconstruction of its methods is thus undertaken as a result of external pressure, and not in response to its own forward movement. It is not until practice is brought into touch with rational investigation, and linked to the spirit of persistent inquiry, that efficiency and progress are to be looked for. The advancement of theoretical knowledge is then systematically reflected in modifications of practice, through a conscious endeavor to found the latter procedure upon the consistent application of principles which science continuously establishes.

This relation is universal. The adequacy of every process concerned in the accomplishment of rational human ends is dependent upon the degree to which scientific analysis of its materials has been carried, and the completeness with which their principles have been apprehended. Whatever the work in which one is engaged, it pays to be a scholar in it. The man who works by rule of thumb, is dependent upon his rules: if they fail him, he is lost. Not knowing the intimate nature of the materials with which he deals, he cannot apprehend the reasons which underlie such rules as have been formulated for his guidance. He must, therefore, follow his instructions blindly. He cannot make new combinations of his materials; he is unable to deal with novel conditions; he finds himself resourceless in emergencies. Scientific knowledge lifts the workman out of this helplessness, and puts him in control of the situation. He is able to lay his hand upon the particular factor which is out of order, and to set it right. The field within which his theoretical principles apply, becomes an open book to him. Scientific knowledge transforms the slave of routine into the master of technique, and puts into his possession a working conception susceptible of infinite modification to meet the specific changes which incessantly arise.

The dependence of successful practice upon theoretical principles becomes more intimate in proportion as the materials dealt with increase in complexity. For example, the whole art of health—in hygienic, prophylactic, and therapeutic fields alike—is scarcely more than the application of that system of principles which the modern study of physiology, pathology, and sanitation reveals. Science has already revolutionized most industrial processes; and, out of its discoveries, new arts are continually springing. The constructive use of materials to-day is as much the product of advance in the sciences of physics, chemistry, and mechanics, as it is a result of invention in the system of manufacturing processes.

In no field is this relation more important than in dealing with the problems of human society. Government, jurisprudence, ethics, penology whether criminal or moral, the art of teaching, the art of living itself, owe the principle of all their higher development to a psychological study of the human self. This study, begun from a multitude of lines of approach, has now become systematic, and is already conscious of the significance which these most diverse investigations possess as contributions to a common aim.

Successful instruction and effective discipline alike are grounded in an intimate acquaintance with the manifold of conscious activities with which the teacher of any child is called upon to deal. Such an understanding is the most important factor in the difficult art of teaching. The utmost quantity of rules will not prevent the unintelligent teacher from going wrong; for no system of maxims can be devised to meet the exhaustless variety of problems which occurs in the course of his work. But a thorough comprehension of child-nature, including a knowledge of the activities involved in learning and instruction, will enable the teacher to understand most of the problems his work presents and to adapt himself to their individual modifications. He will devise his rules as they are needed and remould them freely as occasion arises, without departing from a single underlying principle.

It is this fact which justifies the large amount of theoretical analysis commonly introduced into the work of our professional schools, the aim of which is avowedly technical and practical. The course of study in applied pedagogy, for example, will be found largely composed of a searching inquiry into the nature of education: its meaning and scope, the variety of activities which it involves, the proportional values of these different activities, and the succession of processes which constitutes the progress of education. Its essential aim in all this work is to illuminate the materials with which the teacher is called upon to deal. Least of all does such a course of instruction concern itself with maxims and rules, with suggestions of technique and teaching devices. For this course, the profoundest justification exists. There is immeasurably greater hope of enlightened assistance in the work of teaching from a sincere and thorough study of the workings of normal consciousness in the child, and an acquaintance with the aims and materials of human culture, than from any number of rules and suggestions for individual cases or problems. Understand the child, and one will go far toward knowing how to deal with him.

Such understanding, it is true, does not come through one channel alone. To the final result, a variety of methods ordinarily contributes. Most often man's training proceeds independently of laboratory experimentation, and without perception of the theoretical principles involved. Our practical working knowledge of most arts is won in this way. Experience teaches without conscious design on the learner's part. In our habitual ways of doing things, we commonly improve by unreflective rejection of the wrong and retention of the right elements. The training goes on without our perception, and we become skilled unawares.

The early history of all art is marked by this procedure; but every form of craftsmanship should reflect science as well as practice. The highest attainment in any applied form of activity is reached when art becomes self-conscious and coöperates in its own betterment. Only then is it determined by a rational ideal and its movement made direct, continuous, and progressive. This consciousness of an ideal end is the chief characteristic which separates human activity from that of the brutes. In practical life, it appears as constructive invention and its embodiment in material forms. In intellectual activity, it is the formulation of a problem and the systematic attempt at its solution. In the moral world, it is the representation of an ideal of conduct and the endeavor to conform action to its requirements. Man's achievement in all three regions—of practical skill, of reflective thought, and of ideal conduct—is to be measured by the degree of self-conscious direction to which he has attained.

It is in the art of living itself, that this ideal requirement attains its last and supreme significance. If there be anything worthy of sustained and careful study, it is the human individuals who make up our social world. In them, our highest interests centre and our closest concerns are found. Between ourselves and other persons, mutual adaptation goes on incessantly. We are engaged in moulding our own characters to forms which have no meaning apart from the system of human wills with which we sustain relations. We are also engaged no less persistently in modifying the attitudes of these other wills in such ways as to bring them into harmony with our own purposes and ideals. The subject of these modifications is the most complex reality known to us, full of the subtlest elements and undergoing changes which often defy analysis or representation. To the mere discernment and setting forth of its characteristic reactions, an expert and penetrating observation is requisite. The completion of this task can be achieved only through the coöperation of generations of trained scholars; yet nothing less affords a sufficient basis for the endeavor to mould any human character in accordance with an ideal conception.

In matters concerning self-direction or the guidance of others, the first attempt to apply principles which have been developed through reflective analysis may, therefore, well be disappointing. A long established habit, founded upon organic tendencies and confirmed by incessant discipline, is more to be trusted than the early results of deliberate and self-conscious study. Failures both of comprehension and of application are inevitable in the beginning. But, as features in the development of a higher type of reaction, these mistakes are not to be charged against the method but imputed to our own ignorance or ineptitude. They must be endured for the sake of that which the new method makes possible. For if, when instinctive habit and the method of empiricism have reached their limits in any field of activity, the reflective study of its subject-matter can raise intelligence to new levels of conception which illuminate or rectify our procedure, the initial insufficiency which marks its application becomes a wholly negligible matter.

The mistakes of a Young Mothers' Club may be amusing or deplorable; but the conception of education as a subject for serious study, and the recognition of variety of experience as affording mutual help, promise much for the nurture of future infants. Surely a house will be more fitly equipped to be a living home if the purpose of each article be kept in mind in selecting or fashioning it. Surely it will be more likely to satisfy our love of the beautiful if principles of harmony be observed in the adoption of a color scheme, if the selection of decorative objects be not determined by the individual worth of each piece alone, but also by its congruity with the whole group of which it forms part. Aesthetic satisfaction, in such a case, is bound up with the recognition that there is a science of home-decoration which determines the fitness of each individual element, and that the principles of this science can be ascertained and applied in all such practical work.

The crudities of those painters who first deliberately set themselves to study human anatomy may seem ludicrous to us, but they had seized upon a fundamental truth of representation and endeavored systematically to apply it in their work. The imperfections which marked their drawing were due merely to an inevitable awkwardness in applying this new principle; and, for its later excellence, Italian draughtmanship owes much to their courage in daring to break away from a traditional habit and conceive a higher method of attaining this end. Such errors and awkwardness as characteristically mark the progress of any art as a certain soulless excellence of technique brands its decadence.

The development, in any art, of an intelligent procedure grounded in a rational conception of aim and method, is conditioned by the slow and unsteady progress of human thought in the extension of truth. In general, the perception of their applications has followed very slowly upon the formulation of these abstract principles. For generations, the conceptions of pure science may continue to exist as floating systems of ideas, having no point of contact with the practical problems for which they provide solutions, until some fertile and inventive mind, which has grown up in touch with affairs, seizes their significance and makes application of them. It is not a mere dullness of apprehension which underlies this inertness. The whole weight of tradition, which pervades every form of technical procedure, opposes its inertia to innovations, even when based upon sound theoretical principles. Economic utilization will always lag behind scientific discovery until the traditional attitude of the applied arts has undergone reconstruction, and theoretical principles are methodically conceived in terms of their possible applications.

At the same time, a danger of the opposite type must often be confronted. This is the temptation to make immediate and uncritical application of new theoretical conceptions, especially in periods when scientific research has achieved popular prestige. The incompleteness of its data may not be forgotten, but the desire for a practical return is still more keenly felt. This eagerness to profit by the results of experimental study makes us impatient of delay. We chafe at the slow procedure of science in establishing its conclusions; and, at the first suggestion of their possible values, we make use of principles whose exact applications are not yet clearly discerned. In some such cases, it is only the conditions of their utilization which need rectification; in others, the principles themselves must be revised. The result of this impetuous action is the raising of an ungrounded hope of some great immediate success in the difficult arts of life; and, upon the natural failure to realize it, a reaction is likely to be set up, which leads to an equally unjustifiable disparagement of the general product of investigation in the field in question.

The products of scientific analysis are, of course, not themselves practical maxims. They must be transmuted in the alembic of individual genius before their elements can be embodied in any art. The capacity to discern practical values in such theoretical conceptions cannot be imparted. The general field of their application may be defined, but the specific use to which they are put in any individual case depends upon the artist's sensitive response to the total situation by which he is confronted, which at each successive moment may call for a new and unique modification of procedure.

In the handling of his materials, every craftsman may thus be said to possess a secret. The factors which contribute to success are, nevertheless, definable in terms of three components; namely, sagacity, experience, and knowledge. With congenital endowment, his equipment must begin. One possesses, in regard to any given class of practical problems, a natural intuition which another lacks. Experience may correct this deficiency in part; but no amount of practice, in such a case, will suffice to ensure mastery. To natural endowment, in the second place, practical exercise gives certainty, facility, and a wider scope. Through discipline, aptitude becomes practical wisdom and skill. Experience actualizes each temperamental gift, imparting to it direction and form. Abundant exercise, acting upon a generous endowment, will carry the individual near to the summit of his art. Short of perfection, however, the natural genius must halt if he depend solely upon empirical training. The last step in his progress cannot be taken without the third of these factors, theoretical knowledge. In it is continuously elaborated the basis upon which practice rests; and technical perfection is never attained in any art until its procedure is systematically grounded in these theoretical principles.

It is, of course, also true that applied art is not deducible from those scientific laws in which the nature of its subject-matter is expressed. Science, it is said, teaches us to know and art to use a given material. Now use itself, even when wholly empirical, is necessarily the reflection of a certain knowledge. This mode of apprehending relations, however, affects only particular connections and consequences. It therefore leaves one helpless when one abandons the routine which experience has established. For, when action rests upon empirical rules, all exceptions seem equally foreign to the mind which views them. Variations appear as phenomena to which these rules are inapplicable, because the province within which they hold is conceived discretely, as a fixed and determined field. It thus becomes impossible to extend their application to new phenomena in which the same general laws are operative.

This embargo can be lifted only by putting the reactor in possession of the principles upon which the connections among such phenomena depend. He must know the causal relations in which events are bound together, the constitutive laws according to which subjects are organized. For this knowledge, he must turn to the results of theoretical investigation. Science may be said to have regard for the cause, as art for the effect. It is interested in the consequences of any event only in so far as a scrutiny of the latter affords a general method by which the truth of explanatory conceptions is verified. Art, on the other hand, is interested in the question of origins only in so far as an acquaintance with the causes of things increases the artist's control over materials, and enables him to direct the course of events. In each case, the respective conceptions are supplementary and instrumental.

Science is thus retrospective in its point of view, and applies the method of analysis, while art is prospective, adopting a method which is systematically constructive. In these two individual attitudes, the mind is looking in opposite directions through the perspective of experience. Though they deal with the same general materials, they have independent objects and express their results in radically different terms. Between activities which thus differ in aim and method, in conception and products, there may seem to be no common ground, no possibility of mutual support. Science formulates its results in abstract laws; art expresses its ideals in concrete examples. The latter is the result of a constructive treatment, in which materials are built up in accordance with an ideal type. The former reflects an analytic treatment of phenomena which affords the formula of their synthesis.

In this very statement, however, the first point of connection between the two fields is already made plain. The spheres of their application are identical. The world of experience at large constitutes at once the material to be used in man's ideal synthesis, and the subject-matter of his theoretical analysis. Science and art differ in the forms under which they conceive the content of intuition, not in the fields to which their methods apply. Every item of experience may be conceived either logically or sentimentally. Every event may either enter into the practical reconstructions of the moral will, or be submitted to the reflective analyses of the intellect.

The two forms of activity must thus be congruent with each other. Every element of technique in art must conform to those natural laws of its subject-matter which science aims to formulate. The nature of their common material provides the conditions under which the ideals of art are embodied, and affords the principles which are formulated in reflection. Science is thus an abstract expression of the laws of natural phenomena, which everywhere underlie artistic and practical activities. Scientific principles are, therefore, determinative of artistic procedure to this degree only, that science prescribes the limits within which the forms of art must fall. The artist organizes materials into concrete specific forms in conformity with conditions which the scientist discovers and sets forth in general terms. Within these limits, however, creative art has perfect freedom. The individual types, aesthetic or practical, which a subject-matter makes possible, are infinite in number; and it is in his selection and construction of such specific forms that the artist shows his genius.

Science has, therefore, no prescriptive authority over art. It cannot tell the artist what he must do in a specific set of circumstances in order to attain success. It can only show, when such success has been attained, that its procedure has been in conformity with those natural laws which it is the business of reflective thought to formulate. Science and art may, therefore, be said to rest on independent bases. Their systems are congruent but not mutually implicative. To know science is not to be an artist. Scientific law does not suffice for the creation of a single ideal product, whether practical, moral, or aesthetic. It serves only to reveal the conformity to natural conditions which exist in every such product. No conceivable advance in science, therefore, will ensure productive artistic activity; but, given an individual with artistic genius, all known scientific results will be seized upon to clarify his ideals and guide him to their realization. In this fact lies the whole significance of science for practical procedure.

Science and practice have, therefore, no necessary historical relation. The direction which any ideal activity takes must conform to the natural laws which science formulates, but such conformity may be either reflective or unreflective. Art antedates science historically, as practical sagacity in general precedes theoretical knowledge. Its earliest methods are formulated in the course of practice, and guided by the process of trial and error. At this stage, its conceptions form a group of empirical rules which are only later reduced to order through reflection, and placed upon a systematic basis. Science is thus the necessary logical basis of art, but not its indispensable historical foundation.

Nevertheless, with the progress of reflective thought, the relations of these two forms of activity undergo important changes, which bring them into closer and closer relations. In the beginnings of human culture, not only is the alliance of the two forms of activity far from intimate, but all discoverable contrasts in methods and values are emphasized, and an attitude of mutual distrust and depreciation is fostered. The practical man suspects and despises the theorist; the philosopher regards the man of affairs as an ignorant empiricist. The one is called a visionary whose thought is barren of result; the other is looked upon as an unenlightened slave. As practice is rationalized and its essential dependence upon natural law is apprehended, a sense of the value of abstract principles arises in the mind of the practical man. He becomes more sympathetic with the theorist's point of view and more receptive of his conceptions.

As science, on the other hand, descends from those most general philosophical formulations with which thought first chiefly concerns itself, and grows interested in tracing out with ever-increasing detail the manifold connections which exist within the various classes of phenomena, the system of theoretical conceptions is no longer regarded as divine or independent, existing in splendid isolation from the gross and petty facts of individual experience. Every step of progress brings the two activities into closer sympathy, and increases their points of contact, until at last that ideal of a universal correlation dawns which, as a regulative conception, may be called the greatest achievement of the modern world. Practice at large is discerned to have a rational basis which it is the function of science to determine; and all theoretical knowledge is seen to have its point of application in practical affairs. That no item of practice is necessarily blind and empirical, and no truth a mere idea having logical value alone, is the conception under which we view the world of experience to-day. It is the postulate of this relation which has at last made both procedures fully rational and significant.

Science thus makes practice reflectively self-conscious and intelligent. Because the artist, in his plastic treatment of materials, deals with results and not with causes, he beholds the laws of his subject-matter only as they are dimly reflected in the mirror of his own success or failure. To art, working thus blindly, science reveals the unseen laws with which it has been continuously in contact. It shows why, in practice, one thing has been found necessary, another allowable, a third impossible.

While it cannot, from the limitations of its own problem, prescribe any single feature of the product, science thus makes art intelligent and rational. It provides a way by which the activities of the artist—no longer limited by rules of thumb, though to the end dependent upon individual genius for the specific forms which it originates—may consciously be brought into greater harmony with their conditioning laws.

In its general bearing upon practical activity, science may be said to narrow the path of experimentation. It thus safeguards art from a multitude of specious inventions, and prevents wastage in all its forms. While it does not enable us to say in advance that a procedure theoretically correct will necessarily be successful in any given case, it warrants the prediction, under all circumstances, that a method which is theoretically invalid will be a practical failure. Further, science affords the only means of finally confirming the grounds of practice. Theoretical knowledge gives us confidence in measures which we have found profitable, by showing us that this success has not been due to happy accident, or occasioned by the entrance of some extraneous factor whose presence we have failed to note, but that it has issued from the unvarying principles of the subject-matter itself. Through the work of science, we know that we are right as well as successful.

In each field of activity, theoretical knowledge performs the same essential service, though, as one passes from elementary to complex phenomena, it may now seem to exert a precise directive authority over method, and then to fail in offering any specific rule of procedure. Whether in any given case the principles which science discovers can be successfully applied, depends, among other things, upon the magnitude of the factors of variation, whose significance increases with the complexity of the phenomena involved.

In a system of coefficients of such high order as the human mind, the effective determinants are very numerous. The concomitant variants, also, are likely to be so manifold and subtle that the isolation of a single principle of change will be found wholly insufficient to afford control of the situation. Under such conditions, the effective direction of conduct will naturally be difficult, if not impossible. But a failure of this kind, it should be pointed out, in no way affects the logical relations which exist between science and practice. It merely indicates the necessity of such further development of experimentation as shall make possible the coördination of a larger group of determinants in the utilization of its results.

While this aspect of the problem must constantly be kept in mind in considering the application of psychology to practice, the general relation of the two fields remains clear. Every modification of the human will in conformity with an ideal aim must proceed upon an acquaintance with the mind and its habits, whether this acquaintance be formulated in terms of psychological principles or not. It is the function of mental science to make such acquaintance reflective and systematic. For an impulse grounded in inexplicable conviction, it substitutes a rational plan based upon logical conceptions and formulated in terms of general law. Psychological science thus determines the bases of action involving other human wills, in so far as it is grounded in the attitudes and organization of the mind.

The application of psychology may, therefore, be defined—if we put aside its hygienic value in individual life—as the rational direction and control of conduct.

In this system of social relations, all practical adjustment reflects a body of general principles which represent the typical reactions of the normal human will, as well as certain unique modifications to suit the idiosyncrasies of the individual. These principles of action are commonly acquired unreflectively. One knows, in a given case, what is right to do, but not why it is right. Attention is exclusively centred upon the end to be attained; and, at no point, does the analysis of means and medium systematically engage the mind. The inadequacy of such knowledge is characteristically revealed through failure in adaptation, which prompts a series of modifications until action is finally corrected. By this method of trial and error, one may come at last to a large measure of practical wisdom without any reflective analysis of the attitudes of will involved. Human adaptation in general is indeed allied rather to instinct than to reason.

Psychological study supplements this empirical basis of action in all practical affairs involving the adjustment or control of conduct in conformity with an ideal aim. In the ordinary intercourse of life as it affects our relations to members of the family, to acquaintances, to business associates, and even to those whom we casually meet, every mental principle counts. In testing or training the individual for industrial occupations, in persuading men to new courses of conduct, in changing their ideals and grounds of action, in affecting the beliefs and points of view from which action proceeds, success turns upon the intimacy of one's knowledge concerning the ways in which human minds work, and the modes of approaching and securing coöperation with them. Psychology thus formulates the principles of method upon which, reflectively or unreflectively, every appeal in education or reform must proceed. The orator, the demagogue, the statesman, the advertizer, the priest—all who aim at the persuasion of men to new beliefs and courses of conduct—ground their appeal upon the fundamental and unchanging motives of the human mind.

Psychological investigation has, therefore, its point of application wherever the mind enters, either as part of the ecological environment or as a mediating agent in the production of effects—whether it appear as objective material or subjective activity. It is to mental science that we must turn for the establishment of criteria of efficiency in all branches of activity, whether it be the technical expertness of the arts and trades or a general capacity to maintain harmonious relations in an organized society. It is to mental science that we must turn for an analysis of the complex factors of human belief, judgment, and report, as they affect observation and testimony, conclusions and verdicts, or practical decisions and courses of action. Psychology thus provides the general means of approach to matters of legal and forensic procedure, to advertizing and propaganda, and to the very conduct of business and maintenance of ordinary social relations. It is to mental science, finally, that we must turn for an understanding of the whole dynamic basis of behavior, in its study of inner resistances and compulsions as well as of normal incentives; of hysterical or delusional structures of ideas as well as of orderly and rational conceptions of objective relations; of unconscious mental repressions and protective reactions against inferiority complexes as well as the full and positive expression of the healthy will.

In each of these fields, a multitude of factors contributes to ideal development. Economic efficiency, for example, is determined by the whole psychophysical constitution. Sense-perception and memory, judgment and sagacity, facility of movement and precision of control, imagination, sympathetic feeling, decision of will, and general grasp of mind—however long such a list may be made, there will not be an element which does not find its place in the count of assets and liabilities. The general method of approach to all these constituents of the industrial unit, and the only way in which standards of efficiency can finally be established, is a systematic testing, after the methods of psychology, of the individual's senses, memory, habits of thought, and reactions. Such an undertaking can never be brought to an end, since, in each field, a specific technical criterion must be worked out, and the qualitative differentiation of industrial processes is limitless.

In the practical direction of the will, success, in many instances, turns upon avoiding the provocation of reflection. If an individual is to be persuaded to any course of conduct, it is neither necessary nor wise to arouse criticism of the belief or action proposed. To evoke the introspective attitude in such a case, may imperil the success of the whole undertaking. It is thus typical of the pedagogy of persuasion that it seeks to direct attention systematically to the form of social reaction aimed at or to its value, while methodically avoiding the analysis of its grounds.

But understanding and the habit of critical reflection have also their place in life, playing a part no less significant than that of docility and sympathetic imitation. Their cultivation, therefore, is not a matter which touches the welfare of the individual alone, nor is it committed solely to his care. The institution of education stands for the supplementation of mental development on this side as well as on that of dependable reactions. The organization of the world of experience as an intelligible system can be carried but a little way by the unaided individual intelligence. In order that each shall attain full development, the results of racial experience must be made available in the education of the young.

The material of culture, however, is not merely offered to the learner, who thereafter is made to rely upon his own powers and incentives in mastering it. Educational method represents the systematic attempt to organize this complex material, and to arrange and present it in such a way that the greatest facilitation shall be afforded to the mind in assimilating it. This involves at least two questions which touch the psychologist's work. In each act of assimilation, the mind may be helped or hindered by the way in which materials are presented, and also by the relation which any method of instruction bears to the habits of the mind involved. The individual consciousness does not necessarily adopt the best mode of approach in solving its problems, whether practical or theoretical. It is subject to numberless mistakes of method. In the field of mental activity, one person finds his way easily and swiftly to economical habits; another never attains them. Friction and waste are to be expected as concomitants of all forms of learning; and commonly no systematic attempt is made by the individual to eliminate these factors of loss.

The foundations of both objective and subjective constituents of method are psychological in character. All correct educational procedure, whether practiced by the subject in his own behalf or employed by other persons in directing his activities, is grounded in the essential forms of the mind's activity. Whether this adaptation be consciously made, on the basis of a knowledge of the principles of mental assimilation, or arise as the outcome of unreflective selection, matters not. That is good method in education which conforms to the normal habits of the mind, to its modes of assimilation or synthesis; and no alternative procedure can either find logical justification or hope for practical success.

This application of psychology, like that to the field of industrial efficiency, is of great internal complexity. The first to be systematically approached in the development of applied psychology, its scope has already undergone an enormous extension and given rise to a voluminous literature. Its problems, which are bewildering in their variety, now touch every aspect of mental endowment and activity as well as all the great classes of cultural materials and their values.

The psychological grounding of educational method includes the study of mental development as well as the modes in which the will is influenced and knowledge assimilated. In this connection also, successful direction of the process must rest upon adaptation to the form of change in progress. The child develops through the use of materials which, in general, are afforded by his physical environment and social inheritance. The process, therefore, involves two factors, an inner and an outer. Development is not a self-dependent evolution of the mind; neither is it a forming of the mind by purely external forces. Both of these factors must be given. Development is through reaction upon presented materials, through the control of which educational direction proceeds. In order that such direction shall have its effect it is essential that the nature and course of self-development shall be known, and that materials shall be intelligently selected in relation to each successive phase in its history.

Selection of this kind is developed empirically, and laid up in the proverbial wisdom of education. Psychology undertakes a systematic exploration of the facts of development and thereby provides the necessary basis of procedure in organizing the materials or modifying the form of education to meet the succession of stages in self-development. These changes affect the whole constitution of the self and its functions. Perception, memory, discrimination, conception, reasoning, all undergo development and change of form. The system of interests passes through phase after phase. Motives arise and disappear. Likes and dislikes, sentiments, affections, and desires undergo sweeping transformations in their relation to objects. The world ceaselessly alters under the gaze of the developing self, in consequence of modifications which are taking place in its own nature.

This process constitutes the development of the individual. The form which it will finally take depends upon the whole content of experience and the self's reaction upon it. Whether the materials of culture be arranged under any logical scheme, or heterogeneously presented, matters not. Development proceeds equally in the two cases; it is the final products alone which differ. The function of education is to mould this process of change in conformity with ideal ends, through the selection and arrangement of the materials of experience. Such selective arrangement can proceed intelligently only when it is based on a detailed and systematic knowledge of the course of development which the history of the individual self presents. In other words, the elaboration of this phase of educational method is dependent upon the working out of an adequate genetic psychology, in which each special aptitude and function, each relation and reaction of the self shall be represented, as well as its general course and character.

In the application of scientific principles in this field, it becomes necessary to make a practical distinction between what may be called its positive and its negative aspects; for knowledge may be employed either in the stimulation and support of normal development, or for the purpose of arresting disturbing influences and restoring the equilibrium of relations. Psychology thus affords the basis of therapeutics and penology, as well as of education and efficiency-criteria. In the insane hospital and the physician's practice alike, the clinical value of an exact study of mind appears. Whether a restoration to normal conditions or only an amelioration of the degree of abnormality be possible, treatment must be approached from the mental side. Psychology has, therefore, a point of contact with every form of disturbance into which the mental state and attitude enter as a factor.

The investigations which have hitherto been made in this field, are chiefly the work of physicians or physiologists; and in general the results are not yet systematically recorded. The success of the physician and alienist in their treatment of mental disease, and their control of mental attitudes in relation to physical therapeutics, has largely been a result of direct practical experience without dependence upon literature or instruction.

To a great degree, of course, this must continue to be the case, but only in the sense in which all successful application depends upon the capabilities of the individual concerned. The field is subject to the same exploration as any other complex of phenomena. The results of investigation also may be expressed in terms of general concepts which thus become available for application to each individual case, subject to modifications made necessary by the coexistence of many other factors. The disentangling of this complicated system of elements, to such an extent as to determine principles of procedure, is obviously a difficult task. But a similar undertaking confronts the practitioner in physical diagnosis and the problem of treatment. If it be impracticable to lay down simple rules, it is not because of the lack of specific conditions in the one case more than the other, or the impossibility of expressing them in the form of laws. The same difficulty besets the physician in each of the two fields, yet the value of an inquiry into the factors of physical pathology is never questioned. Until a similar recognition is given both to the status of mental diagnosis and to the method of psychotherapeutics, the medical problem will never be conceived in its full dimensions.

This application of psychology extends to all cases in which it becomes necessary to correct the trend of mental activity and to substitute new ideals and motives, a different emotional background, or reconstructed forms of expression for those which had previously existed. Obviously its field is much wider than that of pathology, and penal measures appear as merely incidental to its general method. It penetrates all educational processes; for, throughout their range, the suppression and eradication of undesirable forms of activity is no less fundamentally involved than the fostering of reactions which conform to the governing ideal.

The system of inherited impulses which manifest themselves in the course of individual development must be studied in their relation to the ideal type, not only as the congenital bases in which permanently important forms of reaction are grounded, but also as possible sources of disturbance and defective adaptation. This involves many considerations, such as the bearing of hereditary tendencies upon the establishment of serviceable habits, the maturation of instinctive aptitudes and their reinforcement through consciously directed stimulation, the cultivation of habits which lack an hereditary basis, the treatment of rudimentary instincts which have lost adaptation to the present conditions of life, and so on.

The scope of genetic psychology, as it bears upon educational problems, must, therefore, be widened to include the entire complex of hereditary relations with which the individual is in contact. The limits of this system recede, as our knowledge increases, until we are led to postulate the whole ancestral series as the theoretical basis of individual character, and to extend indefinitely our practical study of its phenomena as a means of approach to the problems of specific aptitudes and limitations.

The question of the educational value of psychological investigation does not touch the logical relation between the habit of reflective analysis and security in moral activity. The latter pair may represent psychologically inconsistent attitudes; but one must not conclude, therefore, that the practical individual cannot profit by the results of scientific study. As well might it be said that, because one cannot both err and comprehend the error in the same moment, it is impossible to profit by experience and rectify one's mistakes subsequently. If we are told that, in some fortunately endowed individual, the attitudes of teacher and psychologist are successfully conjoined, the expression cannot be taken to mean that, in some personalities, the two characteristic reactions may coexist in a single psychological situation. It marks the fact that some of us, though few, have the happy faculty of taking either of these attitudes successfully on the appropriate occasion. For the two attitudes are psychologically opposed, and cannot be united in a single moment of experience.

When this question is raised, it concerns neither the relation of two forms of mental reaction which are psychologically opposed nor the practical application of psychology in teaching. It is simply a comment upon the effect of particular forms of training upon the individual mind. It asserts that the habitual cultivation of either one of these attitudes renders the alternative mode of regarding the object increasingly difficult; so that, in general, the two activities may be described as incompatible.

This cannot well be questioned. The habit of introspective reflection in one's attitude toward experience interposes an obstacle in the course of any teleological reaction that may be under way. Practical efficiency depends upon prompt response to the situations presented from moment to moment; but the analytic mind characteristically arrests action to consider the nature of the situation as an intellectual problem. Instead of responding to the stimulus, it inquires into the basis of reaction, or speculates concerning its general values.

The world of experience undergoes a transformation as one passes from the practical to the reflective attitude. From the one point of view, it is an object of the moral will, into whose action the intelligence enters merely as guide. From the other, it is a problem for the understanding, whose activity ends with its solution. The habit of conceiving experience logically, tends, therefore, to arrest the movement of the practical will and to neutralize its effects. One cannot perform any act with complete success if, during its performance, he be required to observe the series of conscious or organic changes which it involves. All skill lacks self-consciousness. The movement of the will is direct, continuous, and secure, only when it is undisturbed by introspection. Whether mental or physical processes be in question, is a matter of indifference. To observe any activity reflectively not only interrupts its free course, but substitutes another process which differs essentially in its psychological character.

As a condition of action, therefore, it becomes an important question, under any given circumstances, to determine what attitude the situation logically demands. To teach the child and to make him an object of psychological study, for example, are distinct reactions which can never be united in a single attitude. To do one is to neglect the other. In this case, there can be no question which attitude is in place. The psychologist and the school teacher both study the mind of the child; but it is sheer confusion to suppose that the phrase means the same thing in the two cases. In regard to subject-matter, methods, and results alike, the two points of view are not only different but antagonistic. So long as one regards mind from the standpoint of the teacher, it is impossible for it to become the object of psychological study. The moment one passes over to the latter point of view, pedagogical activity ceases and its object disappears. Mind in the one sense must be dissolved before mind in the other sense can arise.

As to the two applications of the term "mind," there can be no doubt that it lies nearer to common usage to apply the word to the subject of pedagogical study. In education, the mind is invariably conceived as a unity of purposeful activity which exists in relations with a conditioning yet plastic environment. It is not the facts of consciousness which are studied but the significance of conscious facts. The teacher regards the consciousness of the child as a totality, in which the status of any element is determined by its relation to the whole teleological activity. Apart from the significant system into which it enters, it has no meaning and, strictly speaking, no existence.

Consciousness is a unity of functioning which is most characteristically described as a life. It is this mental life which the teacher seeks to understand and to foster. For the psychologist, on the other hand, this unity of teleological functioning simply does not exist. It is not the mind of the child but the child's states of consciousness which he studies. Mental life as a significant whole does not fall within the scope of scientific treatment, nor is a reconstruction of that life the result of any such synthesis of phenomenal elements as the science of psychology provides.

The reaction to the child's mind which education expects, is a delicate and difficult task, which demands the whole attention of the teacher and engrosses activity during its continuance. His mind is kept continually on the stretch to seize and respond to the situations which arise. It requires constant vigilance, swift intuition, rapid yet logical changes of attitude, and continuous reconstruction of materials to meet the kaleidoscopic alterations which his problem presents.

To keep in such constant and intimate contact with the mind of the pupil, necessitates an undivided activity. The child cannot be taught and studied at the same time. Psychological experiments are not part of teaching, nor do they make the one who performs them a teacher. Common sense without a formal law may do much in the way of education, but formal law without common sense can do nothing. The art of teaching, in so far as the natural laws of mind and development are concerned, is summed up in the ability to recognize with swiftness and sureness that unique modification of type which at any moment a given child presents.

The limitations of psychological study in the field of education are imposed by its very point of view, and merely reproduce the essential relations of science at large to the applied arts. Psychology formulates general principles. Its laws are valid only for the class to which they apply as a whole. They express typical distributions representing the curves to which all normal groups conform. But such a law may be embodied, in its ideal or theoretical form, by no individual of the series composing the group—as when an average presents no constant error though every individual judgment be incorrect.

The art of teaching, on the other hand, is individual, implying a personal relation between the teacher and the child with whom he deals. The problem which such a case presents cannot be met by the application of a general law. Its solution turns upon adaptation to the specific features which are involved. Success depends upon the teacher's intuition of the direction and degree to which the child before him departs from the normal or ideal type which alone is the subject of the general law. His adaptation of method and material must be addressed to the peculiar features which the individual case presents. Every child, in this sense of the term, is an exception. The successful teacher, like the successful man of affairs, is he who has intuition to seize the unique situation presented at any moment, and the tact to adapt his own actions to it.

No science can give laws to such an activity, for its elements are logically unseizable. In this regard, as in others, the function of psychology is definitely limited. It provides a system of general conceptions—or normality in mental constitution and reactions as aspects of the human mind at large or of its endless varieties; and of typical elements, rhythms, and stages of development, on the formal side equally with the material. These conceptions, while they do not determine a single feature of practice in any individual case, nevertheless remain of fundamental importance in the general direction and evaluation of educational activities.

# CHAPTER VIII

# THE FIELD OF PSYCHOLOGY

THE field of any science is the specific range of phenomena with which it deals. So long as active research and progress are maintained, this conception never attains fixity. It is affected by every forward movement in the historical development of the science, as the sphere of application of any natural power or mechanical principle is revolutionized by progress in invention.

Several factors contribute to this progressive modification in the conception of any science. One is the enlargement of its range, either by mere geographical addition or by the extension of its methods to some new group of phenomena through the perception of a community of character hitherto undetected. Another is the enrichment of the field from within through the discovery of new elements and relations within the traditional subject-matter of the science itself, which gives rise to new problems and a modified view of its theoretical interests. A third is the reconstruction of fundamental conceptions—of aim and definition—which is, of course, the cardinal element in its effect upon questions of scope and problems.

Further, every science is a unity, and modification in any single regard involves supplementary rearrangements which may finally affect its whole structure. A reform in method, for example, will give a new trend and significance to the problems formulated, as well as affect the range of accessible subject-matter itself. Similarly, the addition of a new province or class of facts will react upon the whole mass. What appears at first sight as a mere quantitative extension may thus cause profound realignments in the conception of internal relations and in the interpretation of experimental results. Redefinition, with the increased precision it introduces into the regulative criteria of a science, exerts an influence which is felt through its whole extent; for, while such changes primarily affect its field, they will also react upon its general means of approach to problems and the relations it bears to other departments of knowledge.

In the general introduction to any science, it is these statements concerning subject-matter and aim which are first expected. As in regard to any novel thing one inquires its name, What is it? and then its function, What is it used for? so in connection with a science, What has it to do with? is the first question, and, What does it try to make of it? is the second. These elements are frequently combined. When it is said that psychology is the science of mind, the term "mind" defines the field (in contrast, for example, with physics) and the term "science" indicates the aim (in opposition, among others, to the view-points of education and philosophy).

Such a statement has primacy not merely in the sense of being preliminary, but in that of being central; for the position adopted here affects the whole activity of the thinker. Everything he does may be said in some way to turn upon this point, whether it be concerned with methods, problems, conclusions, or applications. Whatever helps to make clear the general point of view of any science, will, therefore, contribute to the cumulative definition of its field. For example, its status in the general system of knowledge and the value of its practical applications will be understood only when the nature and limitations of its field are clearly conceived.

To differentiate the self of psychology from that of intuition, to contrast the explanatory concepts of science with the interpretative criteria of philosophy, to discriminate an interest in mental phenomena from a practical regard for the attitudes of the moral will, contribute three specific elements to a definition of the field of mental science. For the meaning of any general definition is developed by drawing a succession of distinctions between the object to be defined and those closely related things with which it is likely to be confused.

This progressive delimitation of its field is achieved by any science as part of its actual historical development. In this regard, the position of psychology is peculiar. The facts with which it deals are the most intimate as well as the most general of our experience; and the accumulation of its material data began, not only before psychology came into existence, but prior to the rise of science itself. The lore of the soul is as ancient as human tradition, for the unity of consciousness is at the centre of things practically and sentimentally as well as epistemologically.

In the status of savagery, before science and letters arose, man's attention was attracted by the problem of his own nature as well as by that of the external world. In both, there were dark places, and terrifying occurrences broke the smooth flow of events. The absent returned in dreams and the dead reappeared in visions. In fainting and trance, even in nightly sleep, a temporary death confronted the bystander. Many common things had a side full of mystery, like shadows and echoes, intangible yet sensibly real, and sleep with its dream-world which rhythmically replaced that of waking life. Presentiments were realized then as now, and fears justified. Prophetic thought seemed thus to have power over the future event, the idea to contain the object. Emotional excitement, stimulants, and disease broke up the well-knit habits of the mind. A blow could mysteriously blot out everything until, in a way no less miraculous, consciousness returned a little later. Frenetic states, depressions, and manias occurred sporadically; and exalted or distorted forms of consciousness, induced by fasting or drugs, showed a depth within its own being at which the soul shuddered, no less than a sensitive rapport with mystic influences in the world beyond it.

In the observation of such facts as these, together with the speculations they provoked, lie the beginnings of psychology. The origins of the science are thus immeasurably remote, and, since all thought revolves about human nature and human experience, the progress of speculation contributed to the accumulation of psychological data, irrespective of the aspect of life with which it dealt or the angle from which it was viewed. Interest in the mind and its activities touched life on all its sides, and found its application in every kind of situation and problem.

In psychology as in no other science, the past has thus been intertwined with the whole history of human culture. It has overflowed and invaded all neighboring fields, sharing its conceptions with practical and moral aims on the one hand, and with metaphysics and religion on the other. In its course of development, this field of ideas, because it is itself the main stream of human thought and experience in which all elements meet and all concepts find a place, has had no definite direction and limits such as mark the history of more specialized and technical sciences.

This primitive study of mind, like that of nature, was grounded in practical considerations. One cannot say that an interest in the fact as such has ever been completely lacking; but it is at least true that, in this case, the stimulus which determined attention and moulded the system of beliefs was to be found in the problem of discovering and controlling the conditions of human destiny. The primitive conception of mind, as well as its practical motive, is reflected in the applications to which this knowledge was put. These have two characteristic forms: divination by dreams, visions, palmistry, etc.; and the control or manipulation of natural forces and of other persons by magic, witchcraft, incantation, and exorcism.

Out of such natural magic, a purely theoretical science has in many instances arisen in the course of a continuous historical development, as in astrononmy, climatology, and chemistry. If this be not the case in theoretical psychology, it has in part been due to the difficulty of applying a technical and objective regard to the more intimate concerns of human life. It is relatively easy to assume such a point of view in relation to the physical world at large, as contrasted with the passionate human forces with which psychology deals. A strictly scientific standpoint arose first in astronomy and physics, penetrated the fields of chemistry and biology next, and only thereafter found acceptance in the study of individual experience and human society.

Modern psychology has thus enjoyed a certain independence of origin, in that it is the result of an extension of the naturalistic point of view to the phenomena of mind after the conceptions of natural law and experimental method had been securely established and the general fabric of belief in divination and witchcraft had suffered collapse. The science of psychology has arisen on new intellectual foundations instead of building up its own structure by a continuous modification of old practices and beliefs. It has therefore a great technical advantage in its freedom from those historical associations and conceptions of application which have weighed like an incubus upon the advance of so many other sciences.

This, however, is but partly true; the independence of psychology is unilateral. Practical magic indeed forms no substantial basis of its modern development; but, out of the same ground from which it sprang, the general structure of religious belief likewise arose. Man projects the image of himself upon the screen of nature, and conceives the world in terms of personal agencies and human purpose. Life with its motives, aspirations, and pains, is universalized, at first as an infinity of local fetiches, but finally in the form of a unitary and divine will. In their more primitive forms, these world-powers are feared and placated, as foreign and inimical beings. In their higher forms, an assimilation of nature has taken place; they are adored and their aid is sought.

The human will, in this final cultural status, identifies itself in both origin and aim with the object of worship. The divine principle becomes the metaphysical ground of existence as well as a warrant for the ideal programmes of life. Interest in the human soul is more and more closely knit up with religion and metaphysics. On the one hand, its components and activities are made a key to the divine nature, which is defined, for example, as the ideal harmonization of will with knowledge, and to the constitution and history of the world, which are interpreted under the conceptions of an anthropomorphic teleology. On the other hand, the logical implications of a metaphysical unity in the world are made the ground of a deduction concerning the necessary nature of the mind.

While the interest in a practical application of primitive conceptions in witchcraft had lapsed before psychology as a science arose, its association with philosophy became an established tradition which determined the whole treatment accorded to the mind. Both aim and mode of approach became metaphysical. It was, therefore, properly called Rational Psychology, as opposed to empirical, a distinction which Wolff sharpened by this notation without in any sense creating it. Whether, in such a case, the nature of reality be inferred from the axioms of intuition, or the nature of mind be deduced from the fundamental conceptions of being, is indifferent; for, in both cases, thesis and method are alike foreign to science. Under this metaphysical conception, mind received its first systematic treatment, which has left so deep an impress on thought and expression that it still holds sway over common speech, and has moulded the current terminology of technical literature.

In this phase of its history, psychology loses contact with natural science. Its theorems must, of course, preserve a measurable conformity with the features of the mind, because they constitute the mould in which its image is to be cast; but they rest on a basis independent of fact. The fixed point of reference in Rational Psychology is a system of metaphysical postulates, in terms of which the empirical content of consciousness must somehow be construed. Instead of affording the law which expresses their relations—the law itself being merely a summary statement of the uniformities they present—the facts become symbols of a law independently valid.

The transition to a distinctively empirical psychology took place under a metaphysical stimulus; but, from its beginnings, the movement was distinguished by a penetration and sincerity of observation which marked it as part of an essentially scientific study of mind. Its first systematic product, elaborated during a century and a half, was a psychology of characteristics: a delineation of the constituents and activities of the mind, which, for accuracy and detailed thoroughness, could hardly be surpassed. This painstaking examination of the actual make-up and habits of the mind constitutes an indispensable stage in the development of modern psychology; for such an analysis was necessary in order that the qualitative wealth of inner experience and its complex relations should become known. It is from this intimate knowledge of mental constitution—though not from it alone—that the great groups of contemporary problems concerning adaptation and correlation, mental types and variations, physical conditions and genesis, have sprung.

In this stage of its history, which may be called the first phase of the modern period, psychology long continued to be guided by metaphysical and theological assumptions. This point of view limited interest and defined the field, even if it did not bias the observation of specific fact. Its decline was gradual; and the reclamation of mental phenomena at large for scientific treatment resulted chiefly from a lapse of interest—if not in the metaphysical problems themselves, at least in this mode of approach—as the naturalistic point of view secured more and more general acceptance.

At the same time, influences from without were beginning to press upon psychology from various directions. The earliest and, on the whole, the most profound, was the application of evolutionary conceptions in the field of biology. This broke down the distinction between man and other organic types, on the mental side no less than the physical, and laid the foundations for a comprehensive treatment of living forms in terms of common principles. A genetic psychology of the largest scope is logically implied in an evolutionary biology. Associated with this development in zoology and botany was a more specialized movement, having the same general direction, in human physiology and in the application of chemical conceptions to the phenomena of organic life. This included a study of the physical conditions of stimulation as well as of the physiological mechanisms of response, and its effect was to throw into vivid light the general problem of this whole plexus of relations from the psychological side.

With these matters, the older observational psychology was not troubled. It defined psychology in terms which gave a precise formal limitation to its field. The distribution of its subject-matter was restricted to mankind, and was approached by a purely introspective method. The maintenance of a clear demarcation of its province from that of adjacent sciences, therefore, presented no great difficulty. The relation of consciousness to physical structures and changes was not essential but incidental. The soul, in action as well as in quality, was ultimately independent of the latter. It was not considered in reference to either a determining stimulus or a necessary reaction. In itself, the mind composed a unity of functions; and the object in studying it was to determine the place of each of these functions in a rational system. Psychology was thus chiefly concerned with a study of the mind's constitution and direction in ideal activity.

In this conception of mind, as a self-contained system of phenomena whose limits are stated strictly in terms of consciousness, psychology has concurred in its more recent definitions as well. The formulations with which current textbooks introduce their subject-matter adhere to this postulate. Psychology is the science of self and the facts of self as manifested in individual experience. It is concerned with psychical phenomena, conscious processes or psychoses. The description and explanation of the phenomena of mind or consciousness is its aim. In these mental activities and conscious states as such, psychological interest centers. Its business is the systematic exploration, under the methods which inductive science imposes, of the constitution of mind and its internal correlations.

This substitutes an empirical study—systematically directed introspection under experimental control—for the logical reflection upon which earlier rational psychology depended. Nevertheless, its field is defined in similar terms, as the system of psychical activities or phenomena. The psychophysical correlations which may exist, whether conditioning or dependent, are incidental to the discussion. The study of stimulus and reaction may be helpful in many ways to psychological science. But with neither of these, if we adhere to the implications of such current definitions, is the latter directly concerned. It is the reaction in consciousness which follows external stimulation or physiological change in the one case, and in the other the mental complex which, generically or in particular, precedes a given form of reaction, that alone affords material for psychological study.

But, in the later development of the science, this conception has undergone a variety of modifications. These changes have been due in part to the natural effects of that extension from within, which, in recent years, has so greatly enlarged the field of psychological investigation. In part, it has been caused by external pressure through a study, from the standpoint of independent sciences, of phenomena with which the correlations of mind bring it into contact. The movement from within has been complex. Its most obvious constituent is to be found in the development of comparative psychology and in its extension both of the experimental method of study and of the guiding conceptions of psychology, until by a succession of rapid strides the whole animal kingdom from man to protozoan had been included within its field of research.

The enormous multiplication of individual types to be studied, in which this extension has resulted, is accompanied by a still more profoundly modifying factor, namely, the extreme qualitative variety of the forms of consciousness to which, in the course of his work, the psychologist must adapt his conceptions. As one passes in review this field of organic life, the whole range of which psychology now confronts, the structural changes which meet the eye are as bewildering as the modifications of function which they condition. They extend from sensory organs and agencies of stimulation to the form and distribution of mechanisms of response, whether locomotive, defensive, or manipulatory. Habitat, foods, stimuli, and conditions of growth, even the structural principles of the organism and the medium in which it lives, undergo sweeping reconstructions which obliterate all but the most general elements of resemblance among the successive types.

The modes of reaction and systems of habits which represent the permanent ecological relations of the organism to its environment, are marked by similar transformations. The whole constitution of the individual, from the qualitative elements of consciousness to its final organization, is involved in this process, which moulds and remoulds living substances to so many different forms. The simple and precise formulae which served the earlier human and classic psychology, fall to pieces when the psychic life of micro-organisms is to be included along with the complex and highly articulated consciousness of man in a common system.

This problem has been met, by the psychologist himself, in a variety of ways. To one phase, he has responded by simplifying and universalizing the essential constituents of the unity of consciousness. This appears when the existence of irritability, discriminative selection, and adaptive reaction, demonstrated in the simplest organic types, are construed as a manifestation of the psychological trinity—affection, cognition, and volition. To another aspect of the problem, he has reacted by substituting for this unitary system of common characters the conception of individual mental functions. Sensitivity, organic memory, space-orientation, learning by imitation, and the like, are then treated as individual behavior-modes, the evolutionary history of each activity being traced as the succession of organic forms is passed in review.

From another point of approach, the psychologist has sought a common measure for his increasingly heterogeneous materials, either by pressing investigation into the more obscure and primitive features of the human mind, thereby demonstrating an actual community of constituents between higher and lower forms of life, or by modifying the conceptions applied to the higher forms of activity themselves, as when reasoning is explained as a system of instinct-complexes, and instinctive reactions in turn are reduced to a succession of tropisms. In a similar way, the comparative psychologist has modified his working conceptions to meet still other demands imposed by the continuous extension of his field.

A second general constituent in this modifying process is to be found in the complication of phenomena by which the psychological student is confronted within the limits of human experience itself. In this field, extension has taken three general directions. The first is from the normal through the exceptional, abnormal, and pathological, to a final disintegration of the unitary self in individual impulses, elementary idea-systems, and persistent reaction-types. This field has hitherto been the most productive of such supplementary modifications. It has occasioned the conceptions of subliminal or subconscious phenomena, of psychic disaggregation and split-off selves, of motor and psychic automatisms, with a host of other working hypotheses. These conceptions, like those already mentioned in the field of comparative psychology, have been necessitated by the discovery of constituents and forms of reaction, even within normal human experience itself, for which traditional explanations were found wholly inadequate.

The second extension leads downward through subnormal and defective types, imbeciles, and idiots, towards a limit which the anencephalous monster may be taken to represent. The third reaches backward from adulthood to youth and infancy, and from foetal to embryonic conditions until, in the fertilized ovum, it meets the comparative psychologist on common ground in dealing with a simple undifferentiated organism. In some of the instances already noted, discontinuity within the field might be urged in defence of a limitation of interest or the exclusion of classes of reactions from consideration. But, in this last case, the whole heterogeneous succession occurs within the limits, not merely of a single species, but of an individual life itself. The need of devising, in the service of continuity, an adequate system of conceptions thus receives a new and greater emphasis.

All these demands have arisen from within, in the course of the psychologist's own work; but, to the readjustments by which they have been met, he has been urged by an independent and extraneous stimulus. This factor is non-psychological in its primary motive, if not in its general significance. But the natural sciences impinge upon mental problems wherever the conditions or products of organic activity come under review, since the constitution and reactions of the organism afford the immediate system of correlatives by means of which the psychologist expresses his results. This movement has had a complex character, affecting both systems of physical change with which mental activity is correlated: the field of the stimulus and that of the reaction.

The study of the physical conditions of consciousness, especially of its physiological locus, has been approached in independence of any primary interest in mental phenomena. While the psychologist has availed himself largely of the results of both physical and physiological research in the technical arrangement of his problems as well as in the correlation of results, he has not been hampered by any confusion between the general province of physics and that of his own special studies. The science of optics, for example, is not confounded with the study of space-perception, or climatology with psychic reaction to weather changes.

All such material may, of course, be considered also as psychological data, since it appears as a constituent of individual experience. Objects in space may be regarded as percepts, the motions that take place among them as forms of sensible change, position as a complex of relations in the field of perception, and so on. Similarly everything has a status in the system of values as well as a characteristic place in the describable world. We are either satisfied with it or desire to change it. But—with such possible exceptions as the apprehension of beauty—we do not confuse our own yearning with the desired object, or imagine that, by discovering a use for any substance, we create the quality on which it depends. The closest practical relations unite the physical change, as ground or consequence, with the reaction of consciousness and its ideal aims. But, in reflection, the two systems maintain their independence, and are treated under disparate conceptions.

In the case of physiology, however, it has been found more difficult to preserve this distinction consistently, and to limit consideration to the strictly physical aspects of the processes studied. It is here that the connection between the worlds of consciousness and movement becomes most intimate and vital. It was, therefore, inevitable that the uniformity of association between the primary series of reactions in nervous and other tissues and the mental activities with which the psychologist deals should have led to the inclusion of the latter group of facts within the system of phenomena which, in the most general sense, is to be considered. For physiology, these mental reactions can never become an independent system, coördinate with the neural processes. The account it gives of them assumes their dependence upon physiological changes throughout. Thus the psychosis is conceived not as a psychological object but merely as one product of nervous action, and its treatment constitutes only a highly specialized topic within physiology at large.

Nevertheless, in certain special fields at least, such as sense-physiology, the very problems which are formulated for study have been furnished by psychology. It is the distribution of color-sensitiveness in the field of vision, or the fusion of images resulting from rapidly repeated stimulation, which provides the question which is to receive a physiological treatment. Throughout the extent of nerve-reactions, though not of its whole field, physiology is largely engaged in accounting for the complexes of consciousness in terms of physical constitution and change.

The study of sensory stimulation in all its forms, and of the mechanism of simple and complex reaction-types, has been so extensive in recent years, while the mass of detailed information it has afforded concerning psycho-physiological correlation has been of such importance to psychology, that physiological methods and conceptions have attained dominance in this field even with psychologists. A sketch of the nervous system and its functions is made the introduction to psychological study. Mental processes are explained in terms of nervous habits and rearrangements. The nature of association and memory is represented by means of anatomical schematisms and lines of nervous discharge. Mental development is translated into terms of medullation and neuromuscular organization. In general, a treatment of the direct psychological relation of experience to the external world, as condition and object of the will's reactions, is replaced by speculative constructions of its physiological relation to mediating processes in the central nervous system.

The psychological significance of this examination, with all its wealth of detail, into the organization, reactions, and history of the human body, is too obvious to require comment. But the modifications to which it has led in the psychologist's working conception, involve more than a reformulation of criteria, and amount sometimes to a plain confusion between the standpoints of independent sciences. The influence of physiological research, and especially its point of view, must therefore be considered in their bearing upon the conceptions which prevail as to the field of psychology.

The second of these two external influences proceeds from the biological study of reactions. The biologist not infrequently makes use of the physiological method in his work, and a rigid application of his own postulates would perhaps require the application of this conception throughout. Nevertheless, as distinguished from the latter, ecological biology is not concerned with the special mechanisms of reaction but with their teleological relations. It construes the response of the organism in terms of its serviceableness to some end, and its object is to determine the complex of adaptations which characterizes the systematic reactions of any given type or individual.

Each organism maintains certain permanent relations with the environment. Its energies are directed to securing food, shelter, warmth, protection, and alliance—in a word, provision for the satisfaction of certain needs and desires. Each reaction may, therefore, be conceived in terms of its approximation to the realization of conditions which determine the maintenance of these relations in an ideal form. Many such adaptive reactions we know to be pervaded by consciousness. Throughout a much greater range, we impute the same general character to them in our practical reactions to the world. In a speculative way, finally, the attribution may of course be universalized, as it is by certain metaphysical schools.

It may perhaps be questioned whether the terms in which the biologist defines his object have, in strictness, any meaning apart from the implications of consciousness and its values. It is beyond question that biology, like physics and chemistry in their own spheres, has a specific task in determining the causal relations which are embodied in the whole system of adaptations by which the organism responds to changes in its environment. It is just the growing perception of this problem which marks the point of positive development in the field of biology within recent years.

But, in addition to an explanation of the mechanism of response and an isolation of the specific irritants which induce it, there is a question of the general situation in which organic reactions occur and the way in which it is to be stated. All such terms as "need," "protection and alliance," "satisfaction of desire," "serviceableness to an end," imply criteria of value and existence in a teleological system. The most general conceptions with which biology deals, such as adaptation itself, are not free from this implication. Thus—even though the working formulae in specific problems be mechanistic—a question still remains as to the postulates which underlie a delimitation of the general field. But, at least, the biologist does not explicitly start from this assumption. Reaction consciously directed to an end is a special form of response having its place in a more general field of organic adaptation with which, as a whole, the science is concerned. Biology, in this phase of its work, is the science of behavior, whether behavior be construed in terms of consciousness or not.

In recent years, as the systematic study of life in its ecological relations has extended, it has been brought into more intimate as well as more extensive contact with the system of phenomena which functional psychology considers in its study of mental adaptation. Especially is this true in the case of comparative psychology, where method is necessarily objective. These two sciences may be said to have come face to face in the study of animal behavior. The reactions of organisms provide their common data, which the psychologist construes in terms of sentience, preferential reaction, affective tone, or other modifications of consciousness; while the biologist treats them as responses to specific objective stimuli which have significance for the life of the organism. It is this construction which chiefly differentiates their points of view.

The results in this field have been similar to those already pointed out. The difficulty of securing a satisfactory criterion for determining the distribution of consciousness, especially in view of the apparent variability in its association with a given function, and the sense of identity in the fundamental nature of behavior in all organic species, has led not merely to modifications in the formulae applied to particular types of life, but to a recasting of the terms in which the subject-matter itself is stated—for example, when the scope of psychology is defined as a study of "organosis" in its most general application.

In this new approximation towards a neighboring science, the primary conception from which procedure starts is again objective; but, instead of the conditioning stimulus, it is now the reaction which becomes the determining element. The psychologist, it need not be said, must always consider behavior as well as physiological function and external stimulus. The mind is historically and socially conditioned in reaction as well as incitement. Its materials of expression must, therefore, be regarded equally with its provoking stimuli. The modification, however, goes farther than to employ the form of response as a means of interpreting the subjective attitude. It proposes a study of the objective rearrangement in its effects upon the conditions of life as a substitute for the inquiry into those forms of conscious activity by which, under certain limitations, such readjustments are characterized.

It is just this shifting of the point of reference, as already remarked in connection with the physiological conditions of consciousness, which forces a consideration of the regulative conceptions which are to guide the psychologist in his work. The system of reactions may justly be regarded as reflecting the subject of consciousness in a sense which does not hold true of the system of stimuli. But this is not a question of using motor responses to represent the mental reaction. It is a proposal to make the reaction, when stripped of all reference to consciousness and its values, the cardinal point in determining the field of psychology.

In still other connections, the same general question as to the nature of the system of facts with which psychology is actually concerned has been raised. One of these may be used to point the consideration which all in common provoke; since it is not dependent upon the complex extensions of recent psychological investigation into fields which bring it into contact with the physical and biological sciences, but has been introduced as a comment upon the earlier classic method of introspection by the normal human mind. It is the query concerning what is actually meant by the terms "mind" and "experience," "mental facts" and "mental laws," as psychology conceives them.

In this particular modification of the central psychological conception, mind is construed as the system of characteristics and habits which the individual presents in his reaction to stimuli. It is what the mind does, not what it is, which is to be considered; and what it does is expressed in bodily attitudes or dispositions and in social reactions. What comes under review by the psychologist, according to this conception, is not the form and conditions of the mental activity as such, but its logical and practical aspects, its products and consequences. These lie open in some degree to even the casual observer, and the intimate companion of any man is in a position to make comprehensive judgments concerning the nature of his mind in this sense of the term. It is thus that we learn the habits and character of the individual, the range and accuracy of his knowledge. By observing the plans he has formed and carried out, or given up, we judge his originating and organizing capacity and his tenacity of purpose. Similarly we may know his predilections in a multitude of affairs, and be familiar with his general tastes and desires.

But it may be questioned whether, in the existence or acquisition of such knowledge, the essential attitude of the psychologist is anywhere necessitated. It rests primarily upon the determination of relations between two objective series, and leaves in doubt the place of the intermediate system of mental activities from which the psychologist takes his departure. That is to say, the aim of all such knowledge is just these objective and social readjustments themselves which are sought as practically important ends. The subjective quality of any experience, the irradiation of ideas within the individual consciousness in question, the mental attitudes and criteria from which its reaction proceeds, are literally of no consequence. With states of consciousness and mental activities as such, one has nothing to do. If they can be cancelled out, so much the better. For what is sought in such a case is a dependable expectation of reaction under specific conditions.

The distinction between such practical knowledge and that with which science is concerned, remains unaltered in passing from one class of subject-matter to another. Thus, in buying clothes, it may be sufficient to know that one color is fast while another fades in the sun. But to know this does not make one a chemist; for, as a science, chemistry is specifically concerned with the constitution and properties of the substances, and with the mechanism of the processes, which result in these unlike reactions to a common stimulus. In other words, the knowledge in question simply illustrates the universal distinction between practical and theoretical interests. However the field of psychology be defined, this point of view in any case falls beyond its limits.

If, now, we turn to the field of consciousness itself which is thus interposed between the presented situation (considered as an objective stimulus-complex) and the individual's reaction to it (likewise conceived as a readjustment in some particular of his relations to the physical world), we shall find that there are two distinct points of view from which mind or experience may be conceived. The one regards its qualitative, the other its relational aspect. The first of these standpoints has close affiliations with what is sometimes called the subjective, the second with what is called the objective point of regard.

Under the first conception, immediate, irreducible experience is intended—the fact, namely, that existence has at each instant a unique qualitative character which constitutes it a moment in the concrete history of an individual subject. In its raw immediacy, one thus knows yellow, noise, cold, and pain; one feels satiety, longing, and dislike. With this qualitative aspect of reality, a second subject cannot be brought face to face, nor can it be shared with him. The experience of another simply is not, and cannot become, my experience. No adequacy of constructive interpretation, no sense of sympathetic intimacy, no accordance in social reaction, will annul this fact.

My mind, when I conceive it in this way, is not obscured from the view of other minds because of the complexity of its workings or the deviousness of its course, but because—to continue the figure—it is not at all a visible object. It is hidden because it is inaccessible. To know another mind, in this sense of the word, is to be that other; that is to say, it is to deny the fact of otherness and to bring the event in question within the category of immediate experience. Whatever the status of this qualitative aspect of existence in reference to any specific problem, and whether it concerns the psychologist's work or not, the uniqueness and exclusiveness of subjective immediacy in each individual experience is a fact to be recognized, not a theory to be discussed.

From the second standpoint, mind is treated in terms of its relations to the objective world. Whatever the qualitative aspect of any experience, it springs from certain stimuli and results in specific reactions. It is in these physical and social connections that the observer is interested. His point of departure is in a system of reality lying beyond the experience of the moment, and his return is to that larger world again. The mind, in this case, is but the point where a stimulus has effect and a reaction is originated. To know it, means to be acquainted with the characteristic response which is made by it to any situation.

When this response is conceived in terms of the physical reactions necessary to the maintenance of life and of the social adaptations of which our fellow-men can take account, it is not essential that the qualitative nature of the experience, as it exists for the subject, should be taken into consideration. In the reckoning which the observer makes, the mental system may be ignored; for it is the characteristic reactions to which it leads, in their objective and social forms alone, in which he is interested. So long as his knowledge of the sequential connections between typical stimuli and the responses which the individual makes to them is secured, the subjective quality of experience which mediates between the two series is negligible.

Such knowledge may even be more exact and complete when the observer is a bystander than when he is himself the subject concerned. The occupancy of the locus of experience in no way ensures an acquaintance with the real character of the mind in this sense of the term. One's estimate of his own capacities may be farther astray than that of the impartial onlooker, and his reaction in any given case may surprise the subject himself as really as his acquaintance. It is indeed the latter to whom we look for sound judgment in regard to such a matter. He is undisturbed by that emotional excitement which is inseparable from personal experience; and his attention is not centred upon the purely subjective aspect of the situation, from which the experient can never wholly free himself.

If we regard the mind from this objective standpoint, it is obviously neither inaccessible nor hidden. One's character is recognized as widely as his acquaintance extends. To one person, it is known less fully than to another. To one, this series of reactions is more familiar than that; and thus individual estimates of character vary. But, to all alike, the data for such knowledge are accessible, the subject himself having simply the position of one observer among an indifferent many.

But this way of dealing with reactions is obviously defective, whether it be considered practically or theoretically; since knowledge of the situation is incomplete in regard to stimulus and reaction alike. For the stimulus is not the agent or situation as it exists for the onlooking individual, in other words, as objectively defined. It is the situation as it is presented in the experience of the subject himself. The reaction, similarly, is not the gross physical movement or socially discernible adaptation. It is the whole attitude of the self aroused by the situation which is thus presented. A full description of the stimulus in physical terms is indeed conceivable, but it cannot be derived from any analysis of the constitution of the external object alone. It must include the organic reaction which this stimulus provokes, and thus be finally stated in physiological terms.

The reaction, likewise, if its full description in physical terms be attempted, must be conceived as the whole complex readjustment, peripheral and central, which the physiological stimulus has evoked. That such a multiplicity of elements of physical change exists (occurring in the body at large and constituting a physiological analogue to both the complex mental situation which is presented and to the reaction in consciousness which it occasions) is a methodological assumption, not a field of data accessible throughout its range and utilizable by the observer in making up his account. This holds true also in regard to practical affairs. The onlooker is constantly driven to recognize the insufficiency of his knowledge of the real stimulus to which response is made as well as the incompleteness of his acquaintance with the reaction itself.

Thus even when the observer's interest lies wholly outside the limits of individual experience, when it is not psychological but merely practical, the subject's report of any situation is indispensable to the completion of his data. If he had possession of all the facts regarding either the physiological effects of the stimulus, or the final readjustment within the body which it arouses, he might be able to predict the reaction upon the physical or social environment. But such knowledge is inaccessible, and the only alternative is to find how the situation presented itself to the subject in question and what his real and complete response to it was, whether such response resulted in the immediate production of changes observable by the onlooker or not.

The psychologist's standpoint cannot be identified with either of the points of view above described. Each individual experience possesses a subjective quality which is at once unsharable and indescribable. It bears also certain relations to both antecedents and consequents in the external world, which it is practically important that the subject and his fellow-men alike should understand. But the psychologist is occupied neither in demonstrating the qualitative uniqueness of each individual experience, nor in tracing the practical consequences of stimuli as they issue in the form of movements. His concern is with facts which cannot be objectively defined, though their existence may under certain conditions be inferred from objective data. The facts thus revealed through intuition he treats in terms of their relations, in whatever direction these relations lead him.

In general, the plexus of connections in which any individual experience stands may be treated in terms of a threefold grouping. The first of these is the relation of antecedence, in which the experience is studied in connection with its conditions, whether these lie within the course of previous experience or derive from the external world in the form of so-called stimuli. The second is the relation of reciprocity, including the material study of the constituents of each individual experience, and the formal study of resemblances and correlations among the phases of such experience. The third and last is the relation of consequence, in which the influence of the event upon both the course of subsequent experience and the forms of expression by which mental activity is characterized are studied.

The second of these three groups is, by definition, restricted to the immediate phenomena of subjective experience. It conforms most closely to the conceptions and methods of the earlier introspective psychology. In contemporary science, the observation of it is systematically controlled and extended statistically. In comparison with the traditional conception of mental constitution, its scheme has consequently undergone both complication and reconstruction. But, in general data and products, this part of psychology remains essentially unmodified. It is an analysis of the psychic system itself to determine its constituents and the forms of their combination in the various orders of synthesis by which mind is characterized. Concerning this part of the psychologist's work, therefore, disagreement is not likely to arise.

It is in the first and third of the foregoing sections, in which the twofold correlation of consciousness with its physical environment is treated, that danger exists of obscuring the fundamental conception which both defines the subject-matter and determines the limits of psychology. In these fields of study, quite as much as in connection with that central system of facts to which normal introspection has been directed from the beginning, consciousness must remain the final point of reference if psychology is to have any independent existence. Otherwise its province will simply be parted between physiology which invades its field from the side of the stimulus, and biology which encroaches from that of the reactions.

For psychology, these correlations of consciousness are necessarily secondary and contingent. To assume either correlative as a dominant conception—that is, to define the province of investigation in terms of the stimulus-field or of the reaction-system—carries one beyond the circle of psychic phenomena into the world of physical materials and their changes; while to unite the two, as is the tendency in much contemporary writing, makes of psychology a pseudo-science created merely by taking slices from two independent sciences and combining them. The maintenance of psychology rests upon a clear definition of its aim as a science, and a perception that the system of consciousness presents a substantial and unitary subject-matter which cannot be dissipated in a confused treatment of individual topics in physics, anatomy, physiology, biology, and anthropology.

If, however, just this solution of continuity is to be avoided, the centrality of consciousness must never be lost sight of. This thesis has two points of application. The first touches the substantial existence of the mental system as the primary field of psychology, and the second concerns its value as an interpretative criterion in the treatment of its physical correlations. In the first place, then, the objective point of view is not homologous with the standpoint of psychology. Practical interest seeks only adaptation, whether it deal with things or men. It is concerned not with the mechanism of any change in itself but with its products or effects. When it has to deal with minds, it therefore treats them in accordance with this general aim, classifying all reactions in terms of their relations to stimuli, which constitute their nearest antecedents in the discernible series of changes which the objective world presents.

If now we can say that a given stimulus inevitably arouses the mental reaction in question, and from such a mental reaction these physical consequences and no others proceed, the middle term which is thus repeated may be dropped from the series and the first and last terms connected directly. Towards this general conclusion, all the conceptions above described tend. The field of actual transformations is reduced to the two physical systems; and their contact is marked only by a theoretical division. But, in the system of reality, mind is not a mere point where stimulus and reaction meet, as these various modifications imply when carried to their logical conclusion. It is psychologically an interposed system, in which the stimulus-field terminates and the reaction-system has its origin; and it is the existence of this mediating system which constitutes both the ground and the limitation of the science. This interposition, as already indicated, implies no interruption of continuity. It is not a metaphysical solution but a methodological subdivision of reality which it involves.

Consciousness, in other words, does not possess an independent field which can be contrasted with that of stimulus- and reaction-loci as something geographically distinct. It not only has a physical correlative in the physiological system of activities aroused by the stimulus and the complex bodily reverberation to which it leads, but may even be described as the flooding of these two fields with ideal values and direction. Nevertheless, it both constitutes in itself a definite and complex system of phenomena, and affords the only means by which an approach can be made to the problem of stating in its fulness the nature of either stimulus or reaction. This system, therefore, instead of receding to the vanishing-point, becomes for psychology the central field of exploration within which repeated and extended analysis, by indirect as well as direct means, reveals an endlessly increasing complexity and integration.

The second application of this thesis is in the psychologist's treatment of the physical changes with which consciousness is correlated, whether as antecedent or consequent. It may be stated by saying that the conception of consciousness and its implications affords the determining reference which both defines the field to which the psychologist limits his activity and supplies the qualitative criterion which guides his work. The systematic reference of consciousness, as already indicated, is to the stimulus-field on the one hand and to the reaction-system on the other. It has no third and independent theater of activity. But, in the psychological treatment of these two groups of phenomena, consciousness must remain a determining conception. The stimulus enters within the circle of consideration only when it ceases to be regarded in terms of physical change, and is treated as the antecedent of a specific qualitative consciousness. The reaction, likewise, becomes subject-matter for psychology only when it is no longer conceived as a movement or material reconstruction, but is construed as the embodiment of a particular mental attitude.

In both of these cases, the situation, as psychologically conceived, is made to turn upon the presence of consciousness as its cardinal point. (The stimulus is that which provokes mental activity, the response that which expresses it.) Thus it assumes as its foundation the existence of affective sensibility and conative tendencies, of hedonic values and preferential reaction in the organism which thus responds to stimulation. To consider irritability in the physiological meaning of the term alone, or reaction as organosis, in the general sense of an adaptation which is not based upon consciousness, is to relinquish this constitutive assumption and to make the implication of consciousness an incident in a larger system. But, for the psychologist, the elimination of consciousness in this way is simply pouring out the baby with the bath; and, in all valid extension of his science or its underlying assumptions, it will be found on closer inspection that this conception still functions.

The psychologist does indeed study the whole system of specific stimuli, whether physical or physiological, which acts upon the senses, as well as the characteristic reactions which the organism makes to them. But these are never, as a matter of fact, construed by him in thoroughgoing mechanical terms. It is the reactions of living creatures in which he is interested, and the stimuli he considers are those only to which such organisms are irritable. Every force may logically be called a stimulus or reagent; and every substance upon which it impinges, may be said to present a reaction in the rearrangement of its physical relations which follows the collision. But no one advocates a modification in our conception of mental science which will make it coextensive with this whole field. Such an extension appears only in the metaphysical universalization of concepts, with which psychology as a special science has nothing to do.

Even within the field of organic life itself, a division obtains between activities which are conceived to fall within the limits of psychological phenomena and those which are excluded from consideration. The former are not restricted to reactions dependent upon the coördination of many individual muscle groups, which can be construed only as reflecting the unity of the organism as a whole, but include also certain adaptive responses mediated by single organs and directed to the readjustment of the relations of that organ individually. Reflex action may be taken to represent this group.

7 This conception, however, is not extended to the whole range of changes occurring within the organism. Absorption, osmosis, and the chemical syntheses of nutrition are commonly excluded from the circle of phenomena which psychology treats. If the question be raised why these forms of reaction, together with such activities as capillary attraction and the selection and rearrangement of materials in the growing crystal, are thus excluded from consideration, the distribution will be seen to turn upon the fact that, in the case of these physical and metabolic reconstructions, it has been found possible to treat the phenomena in a purely mechanical way, as movements and combinations describable in terms of physical conceptions alone.

In its most extended form, psychological treatment is thus still restricted to the sentient world. It is consciousness, in its most elementary forms indeed, but still consciousness, which determines where the line shall be drawn, not mere readjustment in the relations which characterize the system of physical materials. If any of the forms of change enumerated above—osmosis, absorption, etc.—are included by any particular scientist, it will be found that for him these processes are either steeped in consciousness at the moment of their occurrence (as, for example, the activity of the organic cell at large has been conceived) or they are regarded as permanent forms of reaction the development of which has been mediated by consciousness in the past.

The system of habits represents this problem generically. The psychological student finds it necessary to contrast habitual reaction with the selective activity of consciousness. The formation of habit is marked by a progressive decline in directive attention. In its more established types, it has already passed beyond the field of choice and control; while its theoretical limit is a complete dissociation from conscious activity, a condition which is at least approximated in the so-called vital functions, digestion, circulation, and the like. The automatisms of habit, therefore, present in the highest degree the phenomena whose treatment these psychological extensions have been designed to serve. They are highly specialized adaptations in which the response to stimulation is direct and simple, depending upon no interposed activity of consciousness. As organic reactions, they have teleological significance; but they are independent of a psychical correlate. If the field of psychology is to be redefined in terms of biological adaptation instead of mental process, habit-automatisms seem to constitute at once the immediate occasion and sufficient justification for the change.

Nevertheless, habit, which is tenaciously retained within the sphere of psychological discussion, maintains its place simply in virtue of a necessary relation to the selective and organizing activities of consciousness which is predicated of it. Though any given reaction of this type be now dissociated from consciousness, bringing about by purely mechanical processes a teleological readjustment to changes in the external world, it still logically falls to the psychologist to discuss it if it be thus construed as a product of consciousness, namely as a permanent reaction-type developed through the selective and organizing reactions of an antecedent mental activity. In this construction of habit, in which contemporary psychology at large agrees, the centrality of consciousness is maintained; for the habit-form is viewed in the light of psychic values and direction.

The application of this conception in the progressive extension of the field of psychological data is by no means restricted to the immediate reactions of the organism. It determines that growing system of investigations into culture and social history which depends upon the interpretation of permanent products of human activity, such as the monuments of literary and plastic art, or the industrial inventions and general material transformations which have been brought about in the service of mankind. These are legitimate fields of psychological inquiry because—and only because—of the implications of consciousness by which their treatment is everywhere suffused.

Wherever this underlying principle is applied, the psychological point of view is assumed and the phenomenon becomes a datum for the science. It must therefore be said, I believe, that those investigations in which organic stimulation and reaction have been studied by other than physicochemical methods involve the implication of consciousness, whether carried on by physiologists and biologists or by psychologists themselves, and must, in consequence, be classed as psychological inquiries in the strict sense of the term.

In some cases, doubtless, the application of this principle is due to confusion; but, in others, the scientist is under no illusion as to the nature of his work. Psychological science was first laid under obligation to physiology in this field; and that the debt is great as well as obvious a mere list of its contributors sufficiently indicates. More recently the tide has turned in the direction of biology, whose students now hold the same general relation to experimental psychology which physiology possessed a generation ago. It may be assumed that an equal enrichment of the science is to be expected from this side also, and one which will react to the advancement of biology and its conceptions as physiological psychology has influenced the study of physiology. But in this general extension of knowledge it would be the very irony of fate if psychology were to lose sight of those distinctive conceptions upon which her existence as a science rests, through a failure to apprehend the fact that all this constitutes primarily an enrichment of her own system of data, and that, without such a fundamental reference to the forms and values of consciousness, it can have no logical existence.

# CHAPTER IX

## THE LIMITS OF PSYCHOLOGY

THE materials of psychology are primarily afforded by an introspective study of the facts of immediate experience. But this field provides only the starting-point of the psychologist's general inquiry, which at once carries him across the boundaries of his own mental life into a larger world of minds. For this extension of the field, there are at least two reasons. The first is methodological, and results from the significance of the observer's attitude in psychological investigation. In order to study the mental content or activity in an unmodified form and under its natural conditions, the mind must, so far as possible, be relieved of all other interests and responsibilities at the moment. Its participation in the conduct of the experiment—such as the immediate control of conditions or presentation of the stimulus—and in the making and checking of records, should be reduced to a minimum.

Among these modifying elements, none is more significant than the attitude of the subject toward his own experience and its psychological significance. It is equally necessary to avoid an emotional self-consciousness and a reflectively critical attitude on the part of the observer. In many cases, this can be secured only when the subject is kept in ignorance of the nature of the problem under investigation, and of the bearing of his own observation upon its solution. The conditions of experimentation have, therefore, made it the general practice of the psychologist to seek the assistance of an observer who is both freed from all care of what may be called instrumentation, and kept in an attitude of naïve or primary attention to the observation to be made. The first consideration, therefore, concerns only the difficulties of manipulation when the subject is called upon to control the conditions of his own observation.

The second reason for extending the materials of psychological study beyond the primary field of self-observation, springs from the aim of the science itself. For its interest does not terminate with a scrutiny of the subject's own mind, as individual and unique. That mind is indeed sufficient in itself to afford a field for psychological study, as various classical researches have shown. It presents a complex system of correlated phenomena, providing problems both of characterization and of explanation. But, like all natural sciences, psychology looks beyond the individual to series and types, to norms and variations. The object of the psychologist's study is that whole aggregate of minds to which his own belongs merely as one of many.

These minds are not identical in their forms and modes of activity. They vary individually and fall into groups according to their likenesses and differences. To explore these various mental types, to set forth their characteristic features, to formulate their variations and arrange them as typical groups in an orderly classification, is the work of descriptive psychology. It is not personal characterization or individual history, but the common features and laws normal to the human mind at large, or to any of its subgroups, in which interest centers.

In the utilization of this mode of appeal, the psychologist is not brought face to face with his materials considered as immediate experience. He must reconstruct the form of any function, and of the mental life at large, by the interpretation of series of physical changes—words, gestures, acts, and modifications in material objects. The physical events are all that he directly perceives; the minds themselves lie beyond his field of vision and are discernible only indirectly.

This dramatic reconstruction in terms of a significant inner experience we make, of course, quite apart from any scientific interest. Psychology may, therefore, be said simply to adopt the interpretative reconstruction which common sense has made on the basis of the purposeful system of activities expressed in bodily reactions. It is a general predication of the relation which immediate experience presents. As my own bodily activities express my mental life, in the sense of presenting specific correlations with its individual features, so I interpret each individual movement of my neighbor's body in terms of a similar mental change.

Psychology thus avoids the metaphysical problem which a criticism of this process of interpretation involves. Mental life is postulated. The problem of real existence and its cognition is not raised. Yet the product of common-sense interpretation cannot be accepted uncritically, as the basis of a psychological predication of the existence and range of consciousness. The procedure of common-sense is loose. It applies no rigid criterion. It is not consistent in its successive attitudes. The range of significant inner life is now broadened and then restricted as purpose or sentiment changes. In the course of these shiftings, conflicting criteria are applied at different times, the same process being interpreted now in terms of purpose and then in terms of mechanism. At one moment, the whole order of nature is made the expression of a significant spirit; at another, this form of interpretation is denied even to the subject's own acts.

Psychology cannot accept a principle so loosely applied as the basis of its treatment. Either nature is ensouled and every change occurring therein is expressive of an appreciative inner life, or it is not so. In the first case, we are theoretically confronted with the task of formulating the psychology not only of men and brutes but of unicellular animals and plants, not only of living organisms but of inanimate objects and the earth as a whole. For, under the assumption in question, all these existences are part of that general field with which psychology deals, whether it be accessible to the application of technical methods or not. In our sentimental moods, we do thus apply to nature and its changes the conception of a significant life, a life of function and purpose, of sensitivity and appreciation.

The problem, after all, cannot be wholly avoided. In the treatment of types whose affiliation with our own is evident and close, the problem may not be raised, except in the form of an inquiry as to the particular trait of which the physical datum is to be taken as evidence. But, when the divergence has increased to a certain extent, when both habit and structure are materially different from our own, it is certain to arise. What limits shall we set to the distribution of mind? Which class of facts shall we accept as an index of its problems?

To formulate this problem rationally, we must approach it with an understanding of the criteria according to which mind is predicated in connection with other physical activities than those of our own bodies. The argument has been called an analogy; it may also perhaps be called an induction. The alliance of mental with physical phenomena we know directly in the case of our own minds and bodies. Each side here is immediately given. The parallelism is not indirectly verified but directly intuited. Every change in the body is sensed. Every intention, every feeling finds expression in a characteristic bodily modification.

This psychophysical connection is not a merely general association. It is a point-by-point correspondence which may be read from either side. Thus, if my meaning is expressed in words, this relation necessitates that my words should have meaning; that is, the reproduction of the words in their proper order should be capable of reinstating the thought they originally expressed. One thus becomes able to read meaning into words as well as to express meaning through words. And so with every other factor in this physical correlate of mind. Each expression is a symbol for a certain mental content which may indirectly be reached through it.

Now, in the physical world, there are to be found alongside of the observer's body other bodies reproducing his own feature by feature, and manifesting the same general system of functions. The body with its activities, in these other cases, is looked at from without. Its form and functions correspond in general with the observer's own. Concerning the question at issue regarding this physical organism, the only ground for inference is immediate experience. Within that field falls one case in which such a system of activities is known to be more than physical change, namely, that of the observer's body. This, however, is not an isolated case in a larger field; it is the sole datum from which inference can proceed. The situation may, therefore, be stated thus: Wherever consciousness is known to exist, it is in correlation with a physical body and its changes. The one instance exhausts the universe of experience. If, then, in the only case in which the problem of physical and mental correlation is actually resolvable, the connection be found to exist, it may logically be predicated wherever one of the two correlated factors is given. An appreciative inner life is, therefore, asserted in connection with the activities of all human bodies alike.

The system of physical activities which constitutes the basis of inference in the case of other persons, cannot, of course, be observed with any approach to the intimacy with which it is known in the case of our own bodies. Little of that complex manifold of outer and inner changes of which we are immediately aware, is apparent to another observer. One cannot hope, then, by the inspection of such aspects as are discernible in another organism, to arrive at an adequate acquaintance with the correlated mental attitude. Nevertheless, the likeness is sufficient to warrant us in the general ascription of a mind which duplicates the main features of our own while departing from its type in a variety of particulars.

There is perhaps no one element of these bodily changes which we can call essential to the correlation in question—such a physical activity that its absence would entail a denial of the mental correlate in the given case. To differ from our own body in specific points, we say, is not to lack a mind in its entirety but to possess a mind differing from our own in individual features. We make provision for a series of divergent types within the realm of minds.

Since the basis of interpretation in all cases is a system of physical changes, and the associated type of mind is conceived to be reflected in its characteristic forms, the mental system will vary correlatively with alterations in bodily structure and function. Now, in the case of the physical correlate there is presented a series of progressively diverging types which, without essential break, carries us forward to forms extremely unlike our own. We reach organisms in which every individual feature is altered, which present none of those special structures or activities upon which the interpretation of mental constitution in our fellow-men depends. Indeed the series may be carried continuously through the succession of organic types until we have lost all but the most general properties of living substance, and are confronted—for example in the world of plants—with forms and relations which afford almost no practicable ground of comparison with our own.

If the imputation of mental life, in either its specific or its generic characters, be dependent upon specialized activities or connected with forms of structure, that life manifestly cannot be attributed throughout this whole series of modifications. We must formulate the special criteria upon which our attribution turns, and seek to define the limits within which alone we apply this mode of interpretation. In considering the distribution of mind, however, there are at least two questions to be taken into account. The first touches our criterion of the possession of mental life at large, the second affects the evidence for the existence of a conscious aspect in the case of any individual physical activity.

The problem of the extent of correlation between physical and mental changes is not met for the first time when the limits of human activity have been passed, nor even when the interpretation of expressive reactions on the part of other men is undertaken. The observer is confronted by it within the field of his own immediate activity, in the problem whether all bodily processes are accompanied by consciousness, and *per contra,* whether all these processes are subject to modification by consciousness.

Of these questions, the latter will not here be considered. The remaining problem presents three possibilities: first, that the whole system of physiological changes is reflected in consciousness; second, that there are certain activities which as a class are always unconscious, and others which likewise are characteristically accompanied by consciousness; and, finally, that any individual process may now have a form of consciousness correlated with it and then lack such an accompaniment, according to the conditions under which it occurs.

The classical answer to this problem is that only one form of bodily activity is immediately attended by a mental correlate, namely that of the central nervous system. Any physical or physiological process occurring beyond the limits of this system must, therefore, be mediated by nervous activity if it is to be represented in consciousness. But, as the central nervous system is both narrowly restricted geographically and protected against direct exposure to stimulation, it does not, without supplementation, provide the basis for a representation either of the external world or of the organic changes occurring in the body at large. Nor is it fitted to be a medium for the expression of mind, either in terms of characteristic changes within the body, which parallel the mental attitude, or of transformations wrought in the external world through its agency.

On the other hand, the central nervous system is made coextensive with the body by an intricate system of outgrowths which penetrate every part of the organism. It is likewise brought into relation with the external world through the system of end-organs attached to it. In its constitution, also, the nervous system represents the two relations in which the connections of mind and body are characteristically read. It comprises a sensory aspect, which makes possible a representation of the series of special stimulations acting upon the end-organs of sense, in terms of central nervous change. It comprises also a motor aspect, which makes possible an expression of the series of central changes in terms of muscular contraction. In this sense, the central nervous mass has been called a projection system for the whole series of sensitive and mobile points comprised within the limits of the organism.

The nervous system thus stands in unique relations with the body as a whole. It has no such specific function as have stomach, lungs, heart, and kidneys. It contributes no new physical characteristic to the body. It does not even form the necessary condition of discrimination and adaptive response. Its function is to be called general rather than specific. It coördinates and integrates the whole system of bodily activities. No organ or living tissue but is penetrated by its fibrils; no function or reaction which proceeds in independence of it. Touching every part of the organic system, reflecting both its sensitive and reactive aspects, the nervous system is thus aptly constituted to function as the physical basis of consciousness, if we view the latter in terms of its correlation with the whole system of activities which the body manifests.

In order that consciousness shall be predicated, under this conception, there must finally be an activity within the nervous system; and such activity will be accompanied by a characteristic consciousness whatever its original cause. No other physical process, on the other hand, will ever be accompanied by consciousness unless it first gives rise to some form of central nervous change. But, as every part and function of the body is connected with the nervous system, the necessary conditions are given for the reflection in consciousness of the state of activity in the body at large and of each specific change occurring within it. The system of modifications thus represented cannot be restricted to limits narrower than the total group of functions with whose structural basis the elements of the nervous system are interwoven. We must, therefore, say: the activities of the body as a whole are representable in consciousness, in the sense that a change occurring in any part of it may produce a definite effect upon the consciousness of the moment.

On the other hand, if the possibility of either an arrest of functional activity within the central nervous system be admitted, or an interruption of continuity between that system and the rest of the body, there will be no necessary representation in consciousness of any process occurring without its own immediate bounds. Whether, in that case, any individual change is to be reflected in consciousness or not, will depend upon the functional integrity of its locus with the central nervous system at the moment. As conditions change, it will now be represented and then not.

The whole systematic correspondence between mind and body will thus be thrown into doubt, since their relation depends upon the permeability of lines of connection between the central nervous system and the rest of the body. If these lines be closed, neither will the peripheral change affect the central, nor will the central modify the peripheral; neither will stimulation be reproduced in consciousness, nor will mental attitudes find expression through muscular change.

In the interpretation of physical processes in terms of mind, a question of validity is thus raised at the outset. It cannot be deferred until outlying types of organic life are reached. Even in our own bodies, the situation is obscure; and it has only been at the close of a long historical development that technical students have themselves adopted as their working hypothesis the conception of uniform correlation between mental and physical changes, in the relation of the central nervous system to the mind. In every case, it is rather the logic of the situation than specific evidence which determines our judgment in these matters. It is impossible to indicate the minute ramifications of that process of bodily change in which our mental attitudes find expression. It is equally impossible to trace in consciousness the reflection of each element of that vast and subtle system of modifications occurring in the body as the result of physiological conditions and physical stimuli.

The fact that any individual change in the body may or may not be represented in the consciousness of the moment, according to circumstances, enormously complicates the situation by which the psychologist is confronted when he inquires concerning the distribution of mind; and out of it arises a series of special problems. The general question of such representation may be raised concerning any bodily activity whatsoever; for, as the data upon which interpretation proceeds are invariably peripheral in character, modifications in the central nervous system are hidden from psychological observation.

Nor is the range of ambiguity limited to the series of sense-impressions in their relation to central nervous activity. By a further complication, the products of motor activity themselves are subjected to doubt. These processes, which by assumption are the direct result of central nervous activity and are habitually accepted as the characteristic expression of mental attitudes, do not necessarily occur in isolation from the activity of the central system when their significance is thus questioned. Within that system itself, a division between higher and lower is found necessary, the higher levels of nervous change alone—those, namely, which depend upon the cerebral cortex itself—being conceived as the essential correlate of mental activity. If the motor reaction do not involve these higher centers, it will have no representation in consciousness.

The division of peripheral activities to which this conception gives rise does not present two separate groups depending upon different muscular tissues—the striped and unstriped, for example. It is the same movement which is conceived now to involve cortical activity and then to proceed in independence of it. In this fact lies the peculiar difficulty of interpreting reactions in terms of their mental correlates.

The physical datum, in these cases, bears all the characteristic marks of a consciously determined act. It is an adaptive response to the situation, and objectively expresses intelligence and purpose. It may both present a high degree of complexity in itself, and represent an external situation which is similarly complicated. Its form may be such as could result only from a long-continued process of training, originally dependent upon high intelligence. To conceive such a reaction as occurring independently of consciousness, at any stage of its history, may thus be a matter of difficulty; while its proper interpretation is rendered still more complicated by this persistent tendency on the part of the observer.

The psychological significance of any act, as well as of any impression on a sense-organ, will thus depend upon its relation to the central nervous system, not in the sense of its general structural or functional connections, but of the situation which exists at the moment between the peripheral process in question and functional activity in the highest parts of that system. The evidence upon which judgment turns in such cases will either be sought in a determination of the relations in which the two processes stand, according to physiological and histological methods; or it will take the form of an objective interpretation depending upon the whole logical situation presented. The first of these alternatives is completely impracticable as an experimental means of settling the individual case, and its inferential application is excluded by our lack of knowledge concerning the actual neural conditions under which such continuity is or is not to be expected.

Thus, in a series of special activities lying within the field of normal adult experience, the question of psychophysical correlation is already raised. Which process is reflected in consciousness, which is dependent upon consciousness, cannot be told on the basis of specific character in the physical activity involved. Both stimulus and reaction share in this ambiguous character. The impression on eye or ear may have no representation in consciousness, if functional integrity with the central nervous mechanism be at the moment interrupted.

Such breaks appear to occur incessantly in correlation with the distribution of attention. Familiar impressions—continuous or repeated sounds, contact with clothing, odors in the room in which one is at work—thus fail of representation. In sleep, the connection is so far broken that the general system of sensory impressions is in some way temporarily shut off from the cerebrum whose internal activity, as represented in the dream consciousness, maintains its own independent course. Yet we know that these stimuli from the outer world may occasion changes in the dream-content, and thus be reflected in the sleeper's consciousness.

The question whether such connection may not be more widespread than is supposed, throws this whole series of relations into doubt. The distribution of dream-consciousness is itself a case in point. That much of our sleep is pervaded by a mental concomitant none doubts; for the first moments of waking consciousness frequently retain images which have been carried over from dreams. The connection is thus established through memory. But the extent of this correlation, and the connection which in general obtains between the physical changes occurring during sleep and activities of consciousness, have as yet received only a speculative formulation.

Within this group of cases falls a large number of more or less exceptional forms of activity, as well as several types which are essentially normal and important. The exceptional cases are those which, in general, have been described as due to conditions of "disaggregation" in the nervous system. They commonly occur only in connection with a definite and highly integrated form of consciousness. They involve complex conditions of reaction and complicated types of response. Frequently their forms are the result of secondary modifications of behavior, and represent conventional modes of reaction. They stand, therefore, for consciousness in the most direct way; and we call them, in the narrowest sense of the term, expressions of mental attitude.

The occurrence of such responses as the use of the tongue in speech, or of the hand in writing, for example, is difficult to conceive apart from a mental content of which the product is a specific expression. Yet the conditions under which these reactions sometimes occur raise the problem whether, in fact, the complex movement had such a conscious correlate or not. In the handling of objects with which the fingers accidentally come into contact while the mind is otherwise engaged, in automatic writing and mimetic movements, in the speech of one who answers in his sleep to a call or question, in the reading which is continued in the face of overpowering fatigue or drowsiness without any awareness of meaning or movements, in the speech of hysterical subjects when a so-called secondary self has been evoked—in all these cases, certain similarities of condition exist, and a common problem is raised.

These acts are the characteristic expression of our most highly developed forms of consciousness; but, in all the cases in question, special features exist which we interpret as marking its absence. The subject is, in general, unaffected by the changes occurring in the world about him, as in sleep; or he has no intention to perform the movement which takes the form of a voluntary act, or remembrance of it after it has taken place, as in mechanical responses; or his whole significant consciousness seems otherwise engaged at the moment, as in automatic writing and the speech of secondary selves. The problem of interpretation, therefore, arises in a special way in connection with all such cases. Shall we conceive the form of response so elaborated that, by some provision within the nervous system, the impression is drafted off into an adaptive reaction in a way which does not involve the central cortex at all, and that in consequence it is not conditioned or accompanied by consciousness? Or shall we say that a consciousness of both the condition of reaction and the form of response was there, but never as the object of engrossing attention, and irrecoverable in after-consciousness? Or shall we say, finally, that consciousness is not to be conceived as a unity, being the correlative of certain systematic activities within the nervous mass which do not necessarily involve the system as a whole but which may constitute functionally independent and coexisting processes of response? The latter implies that a dissociation or disaggregation within the self is possible: two or a series of such supplementary or split-off consciousnesses potentially coexisting in correlation with a single organism. The question is one of interpretation which cannot be answered by an inspection of the type of reaction, but must turn upon a consideration of the whole situation involved.

If we accept the first hypothesis, that in such cases the reaction is mechanized, in the sense that it is unaccompanied by mental activity in any form, it seems to throw doubt upon the whole process of inferring consciousness from behavior. If we make the second supposition, the function of introspection is invalidated as a criterion in the determination of the problem. If we assert the final alternative, it undermines the unity of consciousness and makes the self of psychology a dissolving aggregation of individuals. For, in the latter case, there is no inherent principle of limitation in the number of so-called selves to be predicated. Any systematic form of response which has attained relative permanence in the complex of functions is sufficient to afford the basis of such a separate self.

In every organic process of the body, and perhaps in each individual cell-activity, would theoretically be grounded, on this assumption, a consciousness narrow in its content but highly integrated and enduring. Under this hypothesis, for example, there would be spinal as well as cerebral selves, and, within the former field, lumbar in addition to cervical. For, if we are to conceive disaggregation generally, spinal consciousness is but a term for the series of complex mental correlates representing the various levels within that system. Man thus becomes a microcosm, and represents in himself not only primitive and highly developed forms of reaction, but also the correlative series of mental types from protozoan to man.

Thus we need not go beyond the phenomena which normal human experience presents in order to be confronted by the problem of the distribution of mind. It appears in every consideration of bodily activity, and presents aspects as perplexing as can be found anywhere within the psychologist's field. Nevertheless it is in connection with mental types rather than mental activities that the question has chiefly been raised.

With this form of the problem, we have already, at one point, come into contact. The phenomena of sleep and their relation to the problem of consciousness are matters, it may be said, of the type rather than of any individual bodily activity and its correlations. One may arrange a series of gradations from complete waking life with its vivid and complex mental content, to profound slumber with its supposed absence of all consciousness. As one grows drowsy and passes into sleep, mental activity becomes less complicated and its content simpler. The mind slackens in alertness, and its self-control is weakened. Mental activity becomes disaggregated; and breaks of increasing significance appear within its associative processes. The senses are dulled; impressions grow faint and, one by one, disappear.

Finally the sense of self is lost; and consciousness vanishes in a dim awareness from which even the last discrimination of subjective and objective has disappeared.

This succession of modifications points to a theoretical limit in which consciousness completely vanishes, and a purely physical system of changes is presented. Not only in the natural unconsciousness of sleep, but also in states artificially aroused or due to abnormal conditions, such as fainting and coma, anaesthesia from drugs and insensibility due to shock or blows, there would then be predicated a field within which no mental correlate attends the physical series of activities which continues to exist.

In these cases, of course, the condition is either exceptional or due to temporary functional relations; but, in its more pronounced departures from our own, the condition appears as a characteristic type, and reflects profound differences in structural organization. The beginning of this series of types is presented within the human species in two forms. The first is exceptional and consists in abnormal under-development of the organism. In low-class idiots and, in extreme degree, in anencephalous monsters, the general question of the connection of physical activities with consciousness is unavoidably raised. No idiot type, perhaps, justifies a thoroughgoing application of the concept of a mechanistic reaction to stimuli unilluminated by consciousness. Nevertheless, the general want of intelligence, the lack of capacity to receive training, the absence of alertness, the simplicity and fixity of reactions, the rhythmical form which activity presents, not only provoke reflection in regard to the significance of any individual response as an index of consciousness, but mark the idiot as an important intermediate type between full human intelligence and a form of existence in which, from its anatomical incompleteness, consciousness must be absent, if the existence of a cerebrum is to be taken as its structural basis.

In human anencephalics, the organism is sensitive to a variety of stimuli to which it makes adaptive responses. Food is taken and assimilated. The functions of the great organs are performed, and the individual is in every way living and adaptive. But consciousness cannot be predicated, even though the organism belongs to that type with which it is most characteristically associated; for there is an absence of that very structural basis with which, in advancing measure, intelligence is connected throughout the whole animal series.

The second typical departure from the conditions of a complex and integrated consciousness, which falls within human limits, is to be found in the earliest developmental stages of the normal individual. The mental content and its forms of synthesis grow more meagre as we retrace the history of the individual through childhood and infancy to the hour of birth. There the chief part of the objective system of stimuli to conscious activity disappears. Whatever content exists during the later uterine period, when the formation of organs has been completed, must be incomparably simpler and more vague than after birth. Retracing the process still farther, the organic types which the growing organism represents become simpler and more primitive until, with the disappearance of the nervous system and the reduction of the organism itself to a mass of undifferentiated cells, there is dissolved the whole structural basis upon which the specific attribution of consciousness is made. Either, then, the descriptive content of the term must be given up or it must be recognized that, in the course of these successive transitions, there has disappeared that very phenomenon with which psychology is concerned.

Both of these series of types—that which runs through idiocy to the anencephalic condition, and that which runs through infancy to the fertilized ovum—lie within the limits of the human species. The third series is that presented by the taxonomic system of living forms. This system, like the former, is characterized by a succession of increasing divergences from the human type, as the scale is traversed, in regard to both structure and behavior.

Concerning those animal types which most closely resemble our own in anatomical features and modes of reaction, our judgment is commonly unhesitating. To these, as to other men, a mental life is attributed; and interest centers only in the problem of its specific features and their relation to our own. But, as the series is followed farther, and the sum of differences increases on the structural as well as the functional side, our interpretation hesitates. The system of changes is similar to that which appears as the ontogenetic series is retraced; and the final types with which we are confronted are identical in the two cases. They are single-celled organisms, which perform all the essential functions of life but without differentiated structures and in ways that must raise the question whether there is any further value in the inference of an accompanying consciousness—an inference which is inevitable in the case of the higher species and our fellow-men.

In all these series, taxonomic and phylogenetic, ontogenetic and functional, gradual differentiation and simplification appears, leading at last to radical unlikeness of type. In each case, therefore, the problem of definition and limitation arises; and, in each case, it can receive only a speculative answer. In the attempt to apply this principle of discrimination, one must be guided by the whole system of phenomena, when no single outstanding feature can be pointed to as the specific correlate of consciousness.

The answer to this problem has been given in terms of four different concepts. The first is that of concomitance between the elementary constituents of mind and matter; the second that of the concomitance of mind with specific grades of material organization; the third that of the concomitance of mind with particular types of adaptation; and the fourth that of the concomitance of mind with certain phases of functioning.

According to the first conception, psychophysical correlation is universal. Mind and matter alike are atomic. As the things of sensible experience are made up of parts and elements, so are individual minds the products of a synthesis of simpler functions and ultimately represent combinations of a primitive mind-stuff. The elements of reality are arranged in pairs; or, if the unit of existence be conceived monistically, each monad is at once physical and mental. Every material atom has its own atomic consciousness, each particle of mind-stuff its own body and expression. Under this conception, reality is essentially dual. The universal existence of mind as the correlate of matter is posited; consciousness is diffused everywhere. Its existence is a general postulate, not a particular and contingent fact whose distribution is to be determined.

One aspect of the problem is thus eliminated. The inquirer is not called upon to indicate the point at which consciousness appears in the series of organic types, nor to assign limits to its occurrence, for it has none. It accompanies all physical existence and change. The essential characteristics of mind must be granted to the simplest forms of existence. Not only will all life be thus marked, but the objects of the inanimate world and its elementary particles as well must be conceived as sentient and discriminative, as subjects of feeling and desire, as manifesting individual will.

Though the particular application of this conception in the interpretation of mental content presents evident difficulties, its methodical service is clear. It provides a doctrine of continuity in the interpretation of behavior. It urges the importance at every point of conceiving the simpler forms of life or of action in consistency with the more complex. It affords a way of stating the process of mental evolution by the complication of elementary activities in higher and higher processes, and, conversely, of treating the functions with which at any stage the psychologist has concretely to deal by resolving them into their theoretical constituents. It provides a metaphysical basis for the assumption of a psychological atomism, both in immediate psychical analysis and in the interpretation of ontogenetic and phylogenetic development.

The second conception limits the distribution of psychical phenomena by assuming a specific grade of physical organization as its basis. The criterion of consciousness commonly adopted in this case is the presence of a brain in the organic system. Beneath this level as well as above it extend life and its phenomena; but, in the former field, its activities are conceived to occur in independence of any conscious correlate. Digestion and assimilation are there, growth and reproduction, even discriminative selection and appropriative reaction, but not consciousness. The adaptations are physiological not psychical. They are tropisms, determined by physical irritation and involving only chemical syntheses and disintegrations. But, above the line thus drawn, the processes in question are conceived to be accompanied by consciousness. Reactions do not simply occur; they are elements in a mental life. The stimuli not only produce responses as before; they are also sensed as they arise, and, in some forms at least, are remembered after they have ceased to act.

The assumption of such a criterion definitely limits the field of consciousness, and consequently marks out the bounds within which psychological inquiry may be made, if the purpose of that science be, as is commonly stated, to give an account of the phenomena of consciousness, and not to describe the behavior of the various types of organisms. In tracing the outlines of that field of inquiry within which immediate introspection does not suffice, as is the case with young children, persons of diseased minds, and the lower animals, the psychologist is thus guided by a specific test, namely, the presence or absence of an encephalon. Where the organic life is conditioned by a brain, its phenomena afford subject-matter for psychological treatment. Where the brain, or the nervous system as a whole, is lacking, no interpretation in terms of subjective reality is to be made.

This conception is doubtlessly fostered by our sense of the enormous difference which separates our own conscious life from the behavior of plants and invertebrate animals. The difficulties by which we are beset, when we endeavor to treat the phenomena of adaptation in these lower ranges of life in terms derived from the manifold and highly definite activities of our own conscious existence, are practically insuperable. In its specific content, consciousness is limited to a special field within the region of life as a whole; and the term is emptied of significance when we try to make the two coextensive.

The division thus commonly adopted does not fall at the boundary which separates animal from vegetable. Within the former class occur forms of life which, in common sense, must be affiliated with the plant and its reactions rather than with our own conscious life. The protozoa as a group belong here, as do also the colonial metazoa, the coelenterates, the molluscs, and perhaps even the worms. The differences which separate these types from the human are of course not completely represented in the absence of a brain. They penetrate the whole body, and include sensory mechanisms, muscular tissues, and general anatomical scheme. But, if we are to single out one special feature to be employed as a criterion, no other offers so available a test as the presence or absence of a brain. It is a profound characteristic, the existence of which carries many implications. It marks a certain grade of development at large with relative precision. Its existence is characterized by specific forms of behavior which are absent in types lacking such an anatomical feature.

The use of the brain as a criterion of consciousness is a measure in defence of meaning. To make consciousness coextensive with physical existence is to strip the term of all that determinate content which gives it significance when applied to our own life. To retain meaning, the term must be limited in its scope; and to restrict its application to organic forms characterized by the presence of an encephalon is to select that physical structure which we find most intimately conditioning our own mental life, as the test by which the presence of an existence essentially similar to our own is to be determined.

On the other hand, there are obvious difficulties to be encountered in the application of such a criterion. As regards behavior, the world of life is not divided into two distinct groups marked by specifically different reactions, the cephalic and the non-cephalic. The development of behavior presents no evident breaks. Higher and lower groups are connected by a series of intermediate types which present relative continuity in their relations. Instead of being far withdrawn from each other, the one group passes into the other by insensible gradations. If there be grounds, as regards external organization, for the limitation of the field of consciousness, it cannot be said to have its justification in any sharp delimitation of two classes of behavior associated with these organic types respectively.

Further, if, regarding behavior as the objective manifestation of organization, we turn to the question of structure, the same lack of demarcation will be found there also. The world of life is not divided into two isolated and contrasted groups, one possessing a brain and the other lacking it. The cephalic type presents a range of variations marked by very great differences in complexity and integrity of organization between its highest and lowest members. The non-cephalic group, likewise, includes such extremes as the complete absence of nervous elements in the protozoa and the high development of the segmented type in the vermes.

Moreover, the two groups are in immediate contact at their edges. No anatomical chasm separates the two, such as divides any two species separated by intermediate forms. When followed downward, the cephalic type is found to disappear in forms difficult to classify.

Indications of a brain appear in the swelling of the foremost nerve-bulbs; but, so slightly do these changes alter the essential type found in the upper grades of the group below, that classification may even be said to turn upon the relations in which the type in question is conceived. One who is tracing the development of the segmented type of nervous system, will see in it a non-cephalic structure. One who is following the development of the brain, will find in it the progenitor of all higher cephalic forms. It is an intermediate type.

The rise of the evolutionistic point of view has given a new meaning to all such intermediate forms. These types do not, as for earlier systematists, simply obscure the problem of classification. They mark a genetic, not merely a logical, relationship among the types which they connect. Even when breaks are found, therefore, continuity must still be assumed. The cephalic type has arisen by successive modifications from the non-cephalic, and the higher of the non-cephalic from the lower in unbroken succession. A fundamental protoplasmic continuity thus unites the highest cephalic forms with the lowest and wholly non-nervous types of organic life.

The psychological difficulty which attaches to such a division of the world of life into conscious and non-conscious groups, appears in its full bearings only when one turns to the phenomena of embryonic development. Whatever may be said as to the magnitude of the differences which separate proximate forms in the evolutionary series and the significance of the mutation theory, the young of any member of the higher group at least passes by a continuous process from the non-cephalic to the cephalic type. The earlier form of organization is not replaced by a later and disparate structure, but is itself transformed into it by insensible modifications in the course of a continuous life. Here, therefore, the division becomes merely a convention, which is useful in marking stages of organic development separated by differences of a certain magnitude, but implies no interruption of continuity such as the distinction at first sight seems to imply.

Within this second category apparently fall various attempts to express psychical activity in terms of relational concepts derived from the physical sciences. The material phenomenon in which attention centers here is that of change or energy. One may conceive the relation as universal, and interpret all physical activity in subjective terms. Every manifestation of force is at the same time an expression of purpose and will. The distribution of mind is thus made coextensive with that of matter, since all material existence is manifested through resistance. The distinction which is made between motion and resistance must then lie within the general field of subjective experience. It cannot be a delimiting concept which makes will correlative with motion, leaving resistance outside the field of subjective phenomena. The two forms of force can be differentiated only in some such terms as offence and defence, as aggressive and self-preservative aspects of the universal psychical.

In this form, the theory differs from that first described only by the modification which appears in the fundamental conception of the physical world. If mind be a correlative of physical change at large—the subjective aspect of energy—then all material existence possesses such an aspect. No complex of substances lacks it, since all compounds must be described in terms of a system of forces. No atom of matter, on the other hand, can exist in separation from it, unless we say that, in so far as the atom is not impinged upon, its resistance is only a potentiality, the concept receiving a positive content through the conflict with other atoms. We should thus have to speak of the sleep of the atom and its awakening through the occurrence of stimulation. If the atom be defined as an hypostasis of energy and nothing more—as simply the metaphysical bearer of motion—then no such distinction would be in place. The system of subjective experience would be a thorough-going correlate of the system of energy which the physical world represents.

Within this general field, various modifications of the concept in question appear. In one of these, consciousness is conceived as a special form of energy, one of many, each of which has its own specific characteristics. Light is such a special form of energy, and heat, electrical activity, and chemical affinity. Among these appears consciousness, qualitatively unique as is each one, but of the same order as the rest.

Under this conception, the distribution of consciousness is limited and particularized. Energy as such does not manifest it, but energy only as it appears under special conditions and relations. One mode of motion is manifested as light, another as heat, a third as consciousness, a fourth as electricity, and so on. The appearance of consciousness is thus conditioned by the existence of certain specific forms of physical activity. But all differences in physical processes are associated with determinate variations in structure. This conception may, therefore, be said to constitute merely a modification of that which bases the determination of consciousness upon the existence of a certain type of material organization.

In still another form of this concept, consciousness is made the subjective aspect of latent energy. Under certain conditions, motion disappears and is dissipated, as when a spring is released or a stone drops to the earth. In other cases, motion disappears but is not dissipated. It remains available for future use and may be transformed into kinetic energy, as when a spring is compressed or a stone reaches the highest point of its ascent when thrown upward. The capacity of a compressed spring or a lifted weight to do work, is called latent energy. This condition of latency in physical energy, according to this form of the criterion, is what we know as consciousness. Wherever latent energy appears, therefore, consciousness must be posited. It is thus made a characteristic not of nervous matter or living substance but of all grades of material organization and may appear equally in a stone and in a man—equally, that is, in respect of its formal existence, not of its specific content. For, as one condition of stress must be treated as complex and another as simple, so also must consciousness, or latent energy, present analogous modifications in composition.

The third criterion looks primarily to reaction, but involves a reference to anatomical bases as well. Consciousness is here conceived as the concomitant of general or specific modes of response to the environment. The general forms of behavior, as well as the specific types of reaction, which characterize the different organic forms, vary within very wide limits. The specific reaction-types depend for their form upon the nature of the stimuli to which the organism responds and the systematic features which condition reaction. Sense-organs and muscles provide the material basis upon which the forms of animal behavior are founded; and variations within these systems of mechanisms make very great and, in certain ways, characteristic differences in the organic type.

But, to complete the description of behavior, a second group of facts must be included; for behavior is a question of the uses to which the materials afforded by sensations and muscle complexes are put. The range of movements may be wide or narrow. The forms of response to a given stimulus may be highly defined or diffuse and obscure. The reaction which is called forth may be fixed or variable, simple or complex, confined to a single form of muscular adaptation or resulting in any one of that whole series which the structural plan makes possible.

These differences in the general character of the response which the organism is capable of making, mark the distinction between high and low grades in the scale of behavior. That reaction is superior which is highly defined, complex, and variable—in other words, which shows modification in response to characteristic differences appearing among the system of stimuli. That organism is high in the general scale of behavior which is marked by the capacity for a wide range of stimuli-discriminations and of differing muscular reactions on the one hand, while on the other its responses present refined modifications corresponding to variations in the specific conditions of reaction.

These features of the organism's adaptive response are of value not merely as means by which behavior may be characterized, but also because they may be used as a criterion of the distribution of consciousness as a concomitant of specific forms of behavior. Introspection reveals certain evident connections between these two things. Our simple, highly defined, and relatively fixed reactions are accompanied by a form of consciousness which is at least commonly obscure, if consciousness can be asserted at all as their uniform concomitant. It is those experiences in which the response is complex, diffused, or subject to great variation, which are typically and intensely conscious.

Most of all is consciousness characteristic of situations in which a definite response has not yet been established, or is not at the moment discoverable. With the progressive clarification of the situation, with fuller discrimination of the system of stimuli involved, and with the establishment of a more direct and fixed connection between the situation and its interpretation—that is, with advance in the direction of setting up an immediate adaptive response to the stimulus—consciousness declines. In the most highly defined forms of reaction, even when such development represents an acquired modification, consciousness has ceased to be a discernible accompaniment. The type of such highly automatized responses is to be sought in the most simple and fixed forms of reaction, whether acquired or congenital, voluntary or involuntary, modifiable or unmodifiable.

If we take this series of facts as our guide, we shall find ourselves recasting the conditions of consciousness in terms of the complications which appear in the form of animal behavior. A certain grade of complexity, or a certain degree of variability, in the response, will now become the criterion of its presence. A variety of modifications in this concept is possible. The criterion may turn upon the inner wealth of discriminable stimuli and the complexity of the elements of possible response. The form of human consciousness is closely related to the rich manifold of stimulations to which the human body is susceptible, and to the variety of motor reactions which its structure makes possible. Where, then, the organism presents a certain range of stimulations and variety of elementary reactions, we may say: here is the necessary background against which consciousness is to be projected, from the existence of which its presence is to be construed.

With the same general situation in mind, namely the inner richness of the elements of stimulation and reaction, attention may, in the next place, turn to the nature of the connections which exist between the specific classes of stimuli and the particular reactions which they elicit. In one case, these connections may be in a single direction—as when a local reflex occurs or a peristaltic movement takes place—in which case the association between stimulus and reaction will be highly definite and fixed. In another case, the connection may be a multiple one, each specific stimulus being capable of calling forth not a single limited reaction but any one of the whole series made possible by the structure of the organism.

In such a case, the stimulus will have no fixed line of discharge. The field of its potential effect is the whole system of activities which the organism represents. It may characteristically result in a single and direct discharge, in which case it will be least conscious. (If the discharge be exclusively into one reaction-system, it will theoretically be unconscious.) It may result in a discharge accompanied by diffusion of excitement over a larger area, in which case there will be a reaction accompanied by consciousness—a reaction apprehended or intended. It may result, finally, in a general diffusion without specific reaction, the whole group of associated reaction-systems taking up the shock of the stimulus and absorbing it without localized response. What this situation presents is not, strictly speaking, the absence of all tendency to reaction but the summation of all such tendencies, which at the instant are so related that their combination produces a state of suspension; in other words, the content in such a case is to be read positively not negatively.

It is these cases which are typically suffused with consciousness. They constitute the experience of hesitation, doubt, deliberation, in so far as their relation to adaptive response is concerned; and that of supplementive association, of apperception or interpretation of the situation, in so far as it relates to the stimulus.

This conception, it is clear, involves a reference to the structural complexity of the nervous system, and cannot be isolated from the grade of organization which is thus assumed. But every criterion based upon reaction-type involves the same reference; while it is, of course, true that the phenomena to which attention is directed in all these cases is not the system of anatomical features as such, but the type of behavior which it manifests. In this form of test, the central element is the variability of the reaction to stimuli.

The same appeal is seen in another and perhaps more complex form of behavior-criterion, namely in the insistence upon progressive modification of reaction in response to changes in the system of stimuli. This form is more complex because it turns to a further aspect of variability as the criterion of consciousness. The whole inner richness of stimulation and elementary reaction may be assumed; the internal diffusion of the stimulus over a wide system of elements may take place; the conditions of its transformation into any one of a multitude of different responses may be given; yet one may still conceive the absence of a conscious correlate.

The number of elements and the complexity of their relations are not a sufficient indication of consciousness if variability be made the controlling idea in our conception. For, even in a complex organization, such as is here imagined, equilibrium may exist, in the sense that the system is capable of attaining a condition of stability in its relations. In such a case, the stimulus must be conceived as taking a definite and habitual, though highly complex, course of irradiation, a given stimulus-type producing on each occasion the same wave of redistribution within the group of elements. The system of things will be complex but not necessarily varied. The organism may, therefore, be regarded under the conception of automatism, and its reactions described in terms of purely physiological tropisms.

In the face of this theoretical possibility, a further phase of variability is seized upon. Consciousness shall be predicated only in those cases where the whole system is subject to modification in response to progressive changes in the stimuli which act upon the organism. In other words, the capacity to learn from experience will be made the criterion of consciousness. If the learning process itself be the point to which the mind turns in this analysis, the criterion will be called the modifiability of behavior; if it be the influence of experience in such modification, it will be termed organic memory, or the like.

The advantage of this last group of conceptions is evident. Upon their application, the field of discussion shifts from theoretical to practical considerations, so to speak. The evidence is no longer secondary and derivative, but primary and immediate. That is to say, the criteria now appealed to are no longer abstract or technical, but just such as we use in our general human interpretations. The universal basis on which consciousness is popularly predicated is that of conduct or behavior, not of organization or anatomical type; for the latter, though confessedly the substrate of behavior-modes, is largely removed from direct observation and revealed only through the slow progress of descriptive science.

The starting-point of all such attribution of consciousness in connection with other organisms is our intuition of the expression of mental states by characteristic reactions in our own experience. Upon the felt identity in behavior proceeds our inference of likeness in the psychical correlate; and, far as this inference may be pushed, it is still in practical judgment dependent upon the observation or assumption of a conduct-basis.

In the conception now described, this characteristic is made the systematic criterion of the distribution of consciousness in the organic world. If the behavior of the type in question be essentially like our own, or at least like those simplest forms of reaction with which, in our own immediate experience, we know consciousness to be associated, we conceive the life of such an organic type to be characterized by a conscious correlate. The difficulty in applying this criterion lies in the function of interpretation. The complexity or variability of behavior is really an inner complication of the situation, not an immediate and obvious feature of the reaction, objectively considered. A simple muscle-contraction, from the point of view which must be taken here, may be a most complex act. Delay in the response to a stimulus—its very failure to appear itself—must often be construed positively as a real and highly developed reaction.

Every response must thus be given its full and proper setting in the dramatic reconstruction of the situation under analysis. But, in this synthetic representation, the observer may err either by ascribing to behavior a complexity which it does not really involve, or by reducing it to terms of too great simplicity. Comparative psychology has wavered between thinking the brutes human and making them automata. The popular conception of animal life undoubtedly errs by reading into its reactions a complexity which the evidence does not justify. Recent psychology, likewise, has in some cases adopted a schematism which reduces essentially higher forms of behavior to chains of simple and unmodifiable tropisms.

The point at issue, however, is not as to the identity in structural formula of tropism, instinctive response, and purposeful action. It is a question of the presence or absence of variation in the inner complexity of the organism as the subject of reactions. It seems on the whole likely that we shall have to modify our conception of the simplicity of behavior in even the most elementary organisms, and ascribe to them a selection and initiative, a variety and complexity of reaction, for which the theory of tropisms does not make sufficient room.

The most elementary organism, equally with the most highly developed, is an original and positive constituent of every reaction-situation in which it appears. What it does is a function of its own nature; and it is that nature which the experimenter is endeavoring to discover through a determination of what things are sought or avoided. Foods and poisons, for example, cannot be defined in objective terms. These very conceptions turn upon the constitution of living substances and their chemical reactions to particular irritants and materials. The systematic variation of stimuli is the experimentalist's means of approach to his problem, in human psychology and the study of infusoria alike. Wherever these objective methods are applied, therefore, the result can only be stated in terms of the characteristic responses made by the organism under such stimulation. But the use of stimulus-control, as contrasted with introspection, should not lead us to overlook the centrality of the factors of specific constitution in the organism and discriminative selection in its reactions.

The final conception, which should not perhaps be given a separate place, makes consciousness neither the necessary correlate of a specific grade of organization nor yet the uniform accompaniment of reactions of a certain complexity. It maintains, on the contrary, that there is no necessary correlation between the type of structure or function and consciousness, that the latter appears and vanishes in connection with even the highest forms of behavior. It is an evanescent phenomenon which enters into the situation only during certain phases of adaptation, namely those stages in which the response is uncertain and hesitation arises as to the reaction to be made.

Consciousness thus appears as the mark of imperfect adaptation. In organic forms which are characterized by few and simple relations with the environment, adaptation may reach a high degree of determinateness, and consciousness will then scarcely rise above the vanishing point. As the multiplicity of relations increases, and the complexity of the conditions represented by any reaction grows greater, the field of consciousness will develop. The range of reaction-alternatives which a situation presents to any individual or organic type is the measure of uncertainty in its responses. When life is constituted of a succession of situations every element of which presents inner complexity, then novelty, doubt, choice, striving, and reconstruction will never be absent. Consciousness under these conditions will be continuous and pervasive, variations incessantly arising from the swing of its focus from point to point in the system of correlated stimuli and reactions.

While consciousness may be called self-eliminative in the sense that it is the characteristic accompaniment of processes in which an adaptive reaction is in course of establishment through progressive selection—the result of which is a decline and eventual elimination of this factor—its disappearance from the system of changes never actually results; since the appearance of constantly new points of friction provides the basis of a continuous mental activity.

The sources of these novel occurrences must be stated in terms of two systems of factors. The first of these is the persistent appearance of new elements and combinations in the stimuli upon which the organism is called to react, which—even in the case of the most highly organized habits—call for incessant refined modifications in the form of behavior. The second set of factors is represented in what may be called the margin of attention. Adaptive activities have their roots in the organism as well as in the world about it. The former construes the environment in terms of its own needs and purposes. When, therefore, any one element has been brought within its systematic group of reactions, the energy represented in its assimilation does not lapse, but, in the human species at least, is turned in new directions and engaged in fresh processes of interpretation and application.

The establishment of any one habit, therefore, merely provides the opportunity to turn attention to some new problem of adaptation. In individual history, one form of habituation gives place to another in endless succession. Adaptation thus approaches no fixed theoretical limit. The field of its future application is indeed extended by each advance that is made. With the progressive refinement of adaptation which marks the transition to higher and higher grades of organic complexity, consciousness therefore becomes more keen, pervasive, and continuous.

This concept, however, is but a further modification of variability in behavior as the criterion of consciousness. It is an insistence, sharper and in greater detail than heretofore, upon the modification of reaction in all its phases and relations as the essential feature with which consciousness is to be connected. Not to be able to learn but to be learning, marks its presence. It presents, therefore, no formal advantages or difficulties which are not found in the preceding group.

In the application of any such criterion, a distinction in the content of the term "consciousness" must be noted. In one sense, it denotes the unity of functions which constitutes individual experience. Each psychical activity is a function in a significant life. Conceived in this way, consciousness stands for an irreducible reality. Each particular process or function is but the unitary conscious life in this phase of its activity or in that, seen now in relation to one condition or object, then in relation to another. Each activity must be interpreted in terms of its relation to this unity. It has no independent status, and cannot be conceived except as a member in such an integrated system of significant relations.

But there is another way in which this same life may be treated. It is a complex of phenomena as well as a unity of functioning. The specific relations among the constituent activities are subject to change. The particular constituents themselves vary. The formal scheme of their connections and sequences is, therefore, subject to incessant modification. Every element and succession of this unitary mental life has a definite character and place in the system of phenomena as a whole, and the determination of their relation and laws constitutes a problem for descriptive or explanatory treatment.

It is this alternative point of view which determines the method of science. Its field of inquiry is uniformly conceived as a complex of phenomena whose correlations are to be worked out. Whether it be material changes or psychical events, makes no difference. It is the nature and relations of the constituents, in the one system as in the other, with which science is concerned. Under this assumption, the mental function must be isolated in thought, and treated as though it were discrete.

For example, it is not memory as a phase of the self's activity with which psychology deals, but memory as a system of phenomena having this relation to the facts of perception and that relation to the facts of reasoning. It is memory as depending upon this type of imagery in one individual, or class of individuals, and upon that in another. It is memory in its association with past impressions or future reactions; memory as it enters into imagination, and conditions reflection; memory as it develops and declines in the course of individual history—which the psychologist studies. The same holds true, of course, for every constituent of the mental life. The latter term stands simply for this system of related elements, a system which presents a vast range of changes both in its constituents and in their relations, as the whole field within which the existence of mental phenomena is assumed passes in review.

When, therefore, we speak of the distribution of consciousness, it is the complex of processes which we must have in mind, not the unity of functioning. The problem should properly be restated in terms of individual functions and their occurrence. The question is thus particularized. The psychologist does not ask what the distribution of consciousness as such may be, but how wide the occurrence of memory is, what the limits of abstract reasoning are, what organic forms share the life of imagination, at what level moral feeling arises,
For the formally single question as to the distribution
and the like.
of consciousness in the organic world is substituted a group of inquiries concerning the several individual functions and their appearance in the scale of life. Under this conception, the problem is not where a line shall be drawn separating the organic world into upper and lower halves, conscious and unconscious; but how we shall describe that world in terms of a series of complications giving a succession of levels in the synthesis of psychical elements and processes, such as sentience, constructive perception, recognition and memory, productive imagination, abstract reasoning, and the like.

It is thus the concept of mental constitution which undergoes modification as the scale of life is passed in review. The unity of functioning is assumed equally at all levels, whether its components be manifold or meagre. The simplest group of activities will mediate it. Were the functions reducible to a single process that unitary life would pervade it; and the greatest complication of its qualitative content or form of organization in no way modifies its essential unity.

We are not called upon, under this conception, to construe the qualitative modifications of this unity intuitionally. We may frankly confess our inability to conceive what it feels like to be a fish or an oyster, a sea-urchin or an amoeba. Our problem is the simpler one of evaluating evidence, at each successive level of physical organization, and in connection with each complication of the reaction system, for the existence of individual constituents in the complex of mental activities at large.

Nevertheless the very admission of any type of organism or class of reactions within the field of psychological study postulates a fundamental identity, not merely with other lower forms of life but with our own being itself. This participation in a common nature and quality of experience may be pervasive and affect the mental constitution as a whole, or it may be limited to even a single characteristic of a most general or elementary type; but it must be there if a psychological material is to be predicated at all.

Reduced to its lowest terms, this postulate includes three elements. The first is sentience, the matrix out of which develop all those specific qualities on which our own highly organized knowledge is based. The second is a sense of otherness and of kind, the root of objectivity in experience and an elementary condition of selfhood. The third is specific affective tone as an immediate quality of experience, the condition of preferential reaction and the primitive ground of all valuation in its higher forms. Without such assumptions as these, the formal conditions of a psychological conception of any process disappear, and the treatment it receives must be purely physical.

## CHAPTER X

## THE METHODS OF PSYCHOLOGY

A DISCUSSION of the methods of any science involves two considerations. The first of these concerns the points of view and criteria under which its work is formulated, giving rise to the problems of general method. In relation to these conceptions, error may occur in three connections. The object at which science aims may be mistaken. In psychology, for example, one may substitute a metaphysical reflection upon the mind's existence for a descriptive treatment of its phenomena. In the second place, the subject-matter with which the scientist deals may be misconceived. In psychology, the so-called borderland abounds in fallacies of this kind, where credulity, deception, and illusions of the sympathetic imagination lead to grotesque vices of observation. A mass of pseudo-scientific data is thus annually offered to the psychologist by the amiable but exasperating amateur. Finally, the method of treating data may vitiate the conclusions which are drawn. Generalization on insufficient grounds and selective bias are representative forms of this defect.

Such errors make necessary that correction of results which is constantly going on throughout the sciences. It is the character of its assumptions and the nature of its technique which allies each special discipline to the whole system of which it is part. In all empirical knowledge, the world is conceived as a problem which is to be approached in a certain uniform way. The subject-matter of each science forms a system of phenomena whose relations are to be expressed in terms of general laws established through a process of experimental investigation. Within this field, all research is subject to the same canons and applies a common method.

The procedure of psychological science and the difficulties it encounters are, therefore, in part a consequence of the experimental approach to knowledge itself, and in part they are peculiar to the subject-matter with which psychology deals, or the methodical requirements it imposes. The point of view and general canons of an empirical method have already been discussed. There remain to be considered, therefore, only those aspects of psychological technique which have their conditions in the specific nature of its data.

Psychology undertakes a systematic study of mind. Its datum is the empirical content of experience regarded subjectively. Within this special field, the starting-point of each student is the system of habits which his own mind presents. Now the immediate field of observation is the origin from which the problems of every scientist spring. His mode of approach is not a characteristic which sets the work of the psychologist off from that of other sciences, as involving a peculiar or unique procedure. But, in the case of psychology, this reaction of the mind upon its own immediate data has given rise to a debate concerning both its conditions and its results, which affords the logical starting-point for any review of psychological method.

This reflection of the mind upon its own processes is called introspection. It has also been termed secondary or intentional self-consciousness, in view of the fact that one is not simply active—remembering, reasoning, enjoying, hoping, desiring, attending, etc.—and engrossed in the object, but attends to these activities themselves as matters of interest and study. This is but another way of expressing the fact that the psychologist is concerned with the system of mental functions as such and not with the several objects of cognition, desire, and the like.

This function of introspection, it has been said, constitutes the peculiar and separating characteristic of psychology; and, in virtue of the supposed implication of certain relations between observer and object, it has been represented as the source of errors which vitiate the whole method of the psychologist and invalidate his results. It is impossible, it is urged first of all, to make such a separation as the function of introspection calls for. Introspection is self-observation. The mind systematically observes its own operations in order to formulate their laws or determine their conditions and relations. Now while such observation meets no obstacle in dealing with physical objects and events, a new situation is presented when the subject-matter is a phenomenon of the observer's mental life. In the former case, he is but a critical bystander, to whom the whole process is foreign and indifferent. But, in the case of introspection, the situation is radically changed. The self is now both subject and object; the mind must be at once observer and observed. It is the subject of the process who at the same time critically regards it.

These conceptions, it is argued, are contradictory. Each activity, while it endures, absorbs the self. Experience is a succession of psychologically simple and dominant attitudes. The self is a unitary being which, at any moment, can have but a single logical object. A content there must be so long as mental activity persists, but that content cannot be the activity of consciousness itself which enters into the moment of experience in question. If the process which exists be one of critical observation, its object cannot be that attitude of critical observation itself, but must be some phenomenon lying beyond it. The expression of anger in another person may be regarded like any objective fact; but to be angry and, at the same time, to observe one's anger, is impossible. There is no shadowy, secondary self, observant and critical, which hovers above the naïve, passionate, strenuous self, analysing its activities and bringing them into a rational system. Introspection is a logical absurdity.

To all this, it must be replied simply that the situation is misconceived. Psychology attempts no fantastic feat of metaphysics, by resolving the unity of experience into a plurality of mythical selves. Introspection calls only for the systematization, under methodical supervision, of an activity which enters into every man's daily life. In a word, it seeks to make accurate and comprehensive the reflective study of mental habits, tastes, and judgments, and of the methods by which they are formed and applied. Introspection is reflective and scientific self-observation.

Such observation is subject, of course, to the general conditions under which mental activity takes place. What every one does incidentally, under a practical incentive, psychology seeks to do systematically, under the conditions of experimental investigation. If a fit of anger or any other type of mental event cannot both possess the mind and be observed at the same time, psychology will seek knowledge of it in some other way; for it attempts a study of the mental life under the general conditions of actuality.

Now it is true of the activities of consciousness at large, that the process cannot be arrested and still held before the mind as an object of contemplation. It is necessarily destroyed by any such interruption, since the activity upon which its continuance depends has thereby been drafted to a new object. But every mental process, on the other hand, becomes a potential object of contemplation the moment it has passed away. For present consciousness, the reaction of the preceding moment is as much a content as any phenomenon of the external world. It is just this return of consciousness upon its own past experience in a mood of critical observation, especially upon what is still fresh in mind on account of its recency, which constitutes psychological introspection. The process is thus more properly to be termed retrospection; for what is characteristically in question in such cases is the reflection of past activity in a present consciousness.

If this objection to the procedure of introspection as essentially contradictory be set aside, and one turn to the material difficulties which have been urged against it, the first to be encountered is perhaps that which is grounded in a sense of the evanescent and irrevocable nature of mental phenomena—as contrasted with the substantial and permanent character of objects in the material world, with which the physical sciences deal. That there is constant change in the content of any individual consciousness from moment to moment, needs no illustration. Arrest never occurs in the continuous flow of mental experience; and static conditions are, therefore, not to be found. It is mental process with which the psychologist deals, as distinguished from states of mind having historical permanence. The term "state" when thus applied, expresses the result of a purely logical analysis, indicating the typical features of any representative attitude or reaction. Every such attitude is a transitive phase in the endless flux of experience in which, as a total mental situation, it can never recur. Inasmuch as each mental attitude is thus essentially fleeting and irrevocable, it is urged both that observation of it as it passes must be inadequate, and that its subsequent representation for the purpose of description is subject to characteristic errors.

But although this is true, the situation is not unique. The objection affects all inquiries alike in which the phenomenon observed is transitory in character. It finds its application as much in the observation of physical processes as in psychological introspection. The form of a trajectory, the progress of a chemical synthesis, the process of cell-division in mitosis, the stages of digestion or of a disease, the adaptive movements of the eye in vision, the action of wind or water upon transportable materials—all these present a whirlwind of succeeding phases, the chronological order and constituents of which it may be quite impossible to determine without the aid of complex recording instruments.

The problem, wherever it arises, is one which can be met only by assiduous training in the technique of exact observation, and by ingenuity in the invention of mechanical aids in registering the changes under consideration. To a greater or less degree, each science has developed its own technique in such matters—for example, in the photography of successive phases of position in the study of moving objects, in the graphic record of organic activities by the physiologist, and in the staining methods of histological investigation. More generally, it is represented in the artificial reproduction of any given form of change in materials or at rates which allow of that deliberate scrutiny which the natural occurrence precludes.

The general means on which psychology relies in securing a substantial record of any mental reaction, are not restricted to the introspective consciousness of the reactor himself, but include all circumstantial accompaniments on the physical side which may throw light upon its nature and course. Every experimentalist knows that he must be prepared, at any moment in the progress of an investigation, to find the subject's introspective report contradicted by the reaction record. He must also recognize that such physical registration may become an indispensable datum in determining the actual nature of the fact by which he is confronted. In this appeal, the student does not in the least depart from a strictly psychological procedure. What differentiates his work from that of other sciences, is the use made of observations, not any essential unlikeness in the conditions under which the work is carried on.

The psychologist takes every possible advantage of the controllable materials and measurable changes of the physical world as a means both of stimulating and of recording mental activity. His attitude differs, however, from that of the physical scientist in the fact that he employs these forms of stimulation and instruments of reaction solely as a means to arouse or to measure and record the mental activity which he is engaged in studying. The series of variations introduced is, therefore, very different when the physical scientist studies the nature of light or the laws of color-combination on the one hand, and the psychologist studies vision or the laws of color-perception on the other. The one seeks to determine the constitution of matter and its laws by the series of questions which he arranges. The other, by a similar series, attempts to lay bare the constitution of the mind and its complex of habits. The utilization of this class of materials is an important aspect of psychological experimentation. It affords an extensive basis for supplementation and correction of the subjective report in many of those relations where introspection is rendered insecure through the transiency of any attitude in the swift succession of mental states which is to be described.

Finally, as regards the subjective experience itself, it has already been pointed out in a previous chapter that, in psychological inquiry, it is not the immediate quality of any individual attitude or reaction which is in question, but the representative conditions and relations under which it arises. What that moment of consciousness in which I discriminate the louder of two tones, or prefer one to the other, or apprehend their place in a melodic phrase actually is, in its quality as pure experience, I may be able neither to describe nor to recall. In that sense, the mental event is probably irrecoverable as well as transitive. But it is obviously possible not only to repeat the objective stimulus, but to vary it systematically and extend it to other subjects, in order to ascertain whether the same discrimination or preference is consistently reported. If, as has been said, it be just these aspects of the situation with which the psychologist is concerned, the instability of any mental state and its uniqueness in the succession of attitudes becomes a negligible matter.

Against the value of that critical retrospect of experience which psychology employs, it has further been urged that, while there is much of its content which may be remembered and described, there is also much that, from its very nature, cannot be clearly recalled or accurately reproduced. Simple or indifferent facts may thus be dealt with; and, in so far as only these enter into consideration, the use of the memory may be adequate as a means of approach to states of mind which, at the moment of their occurrence, could not be objectified or scrutinized. But, though certain moments may present an elementary content, the texture of experience is usually of a very complex composition, and its concrete elements are so interwoven and fused, so numerous and subtle, that it surpasses our powers either to analyze and set them forth, or to retain and recall them in memory as an unanalyzed total. Under these conditions, it is said, the adequacy of memory as a systematic means of approach to psychological problems, breaks down completely.

Now the practical effect of inner complication is of the same general nature as that of instability in the mental state. It increases the difficulties of reflective analysis; and the obstacle it imposes to the prosecution of a particular investigation may, at any given stage in the development of psychological method, be disabling. Introspection not only has returned many times in the course of its history for the reinspection of a process already subjected to scrutiny, but, in its very nature, presents a field for indefinite expansion and refinement. The texture of experience is complex in both elements and relations. Neither a single examination, nor any limited series, justifies one in saying that its constitution has been completely revealed.

It is the untiring insistence upon a return to already familiar fields for a reëxamination of their data, which constitutes the very principle of progress in science at large. The requirement is imposed upon psychology more strongly, perhaps, if its material have a more subtle composition than is elsewhere the case, but not in any peculiar or separating sense. And the method must be called an essentially adequate measure in its application to mental as well as to material phenomena. The typical instances of its success are to be found no less in the recent advances of psychoanalysis and controlled introspection than in those earlier examples which have become the classics of descriptive psychology.

The objection in question is really grounded in the impossibility of confronting the content of intuition at any moment as a totality, and yet retaining a discriminative consciousness of its inner constitution. But the very method of psychological science is to substitute for this attitude an analysis which will allow each factor of the experience to be studied in succession as attention seizes upon it, until its composition has been worked out. What an earlier test has failed to show a later may reveal; what is overlooked in one investigation may be brought to light by another.

Of the mental as of the physical field, part only is visible from any given outlook. The shifting of the standpoint and angle of vision, the application of new conceptions, the variation of selective attention, the introduction of a novel principle of interpretation, afford a method of sifting the contents of experience of which an untechnical observation is wholly incapable. The attack upon any complex mental object is hopeless as long as the psychologist depends on uncontrolled introspection; but the chemist looks with equal helplessness upon a lump of organic matter in the absence of retorts and filters, solvents and reagents. And as the composition of a salt or alcohol is laid bare through the application of analytic methods, so also is the constitution of a perception or judgment. Psychology has its own special difficulties to face, but encounters no general problem of method in this field.

The material difficulties which confront the introspective psychologist may be said to culminate in a relation to the mental content which is made the ground of a final objection to his method. All experience is significant. Even its most trivial and evanescent phases have a certain objective reference and specific worth in our ideal syntheses. Through the whole web of experience runs the thread of this subjective valuation, giving significance and emotional quality to its stream.

The presence of this element in consciousness has an effect analogous to that of an increase in material complexity, in its interference with the process of reproduction. In the representation of past experience through memory, the emotional quality it possesses is unseizable. Its formal features and objective relations alone are found to be retained. It is indeed true that, when one recalls an experience which was highly charged with feeling, or ideally significant, the act results in a reinstatement of the original attitude itself, and not merely in a circumstantial memory of the event. But, since the essential nature of such recall, as a present experience, places it beyond the scope of critical observation, its appearance affords no assistance to the psychological student. No mere addition of new significant moments will so transform the relation of content to experient as to make the former accessible to critical treatment.

If it be thus impossible to secure, through the activity of memory, that psychological view of the content of consciousness which is precluded by the nature of the original experience, the general subject-matter of psychology must be said to lie beyond the reach of introspective method. For it is not solely in the nature of the individual experiences to be recalled—which here and there may present unreproducible complexities—

that the disability of retrospection is held to lie, but in the fundamental nature of the relation which exists between the experience and its subsequent reproduction in the imagination.

So important has this source of error been considered that it has received the name "Psychologist's Fallacy," as if the technical student of mind were especially prone to distort the features of past experience in the effort to recall their character. The original material of intuition, when thus reproduced in memory, is insidiously transformed in consequence of the presence, in the later moment, of elements which the earlier did not contain, as well as through inevitable modifications in the features of that previous state of mind itself. This vitiating distortion, it is said, the psychologist fails to discern; and his description reproduces the features of the transformed image instead of the reality.

The fallacy of this charge should be obvious. If such defects existed in the general function of memory, it could never have become the serviceable guide it is found to be in all practical affairs. Nor could the development of physical science be accounted for; since there, as well as in the field of psychological observation, dependence is continually placed upon the faithfulness of memory to its original. But if, under special conditions, the process of recall be subject to such distortion, as indeed we know it is, the highest development of accuracy is surely to be expected of one whose interest is professionally engaged with these very phenomena, who is not only alert to avoid such errors but has also had special training in the discovery and correction of them. Least of all should this be called the psychologist's fallacy, since it is he who is most likely to discern and avoid it.

In its typical form, this defect appears only when the transformation of experience is not recognized. It is, therefore, to be habitually expected in the naïve and uncritical mind alone. The recognition which psychology methodically gives to this phase of experience does not necessarily lead to a complete rectification of the error; but it renders the observer more cautious in his procedure and more critical of his results. It therefore sharpens attention to the nature of the original experience, and stimulates the endeavor after an adequate recall of its features.

In conceiving the act of recall, it is, of course, incorrect to imagine it as involving a reproduction, in the psychological sense, of the past experience. Nothing of the kind really occurs. If it were to take place, the resulting situation would be wholly different from that of recollection. Remembrance in such a case would be supplanted by the reinstatement of certain significant aspects of the original experience, modified by such additional concomitants as the present circumstances inevitably introduce. In remembering, on the contrary, the constituents of the experience are identified, element by element, without the recrudescence at any point of the concrete mental complex in which they were incorporated.

While the objects of mental activity may be recalled and reproduced at will, the actual process in which they are represented can never be reinstated. Each section of its flow is unique and unreproducible; once gone, it is gone forever. What one recalls is not the experience as a moment in individual consciousness. It is a certain treatment of that event which serves our practical purpose of giving unity to the succession of moments and the system of individual experiences in a social world. In every case of recall, the event recollected is one thing;

the self which recalls it and the experience in which it is recalled are other things. The two realities cannot be identified or even amalgamated. If the interest of psychology lay in this subjective experience as such, the situation might perhaps be called desperate. But the aims of psychology have never required such a reinstating of past experience, nor could they in any way be served by it. The only essential requirement in this retrospect is that it shall represent some actual historical moment in individual consciousness, and that it shall correctly reproduce its objective features and relations.

It is further to be remembered that the characteristic procedure of psychology is not introspective at all, if by that term be meant a process in which one takes a critically observant or self-conscious attitude toward experience. In its typical form, psychological method depends upon the report of a mental reaction expressed in purely objective terms. I saw three dots; the first sound was the louder; the object moved to the right; the periods of time were equal; the numbers spoken were so and so, or given in such and such an order; the movement I now make is equal to that made previously; I liked the yellow color best; I thought of an orange when fruit was mentioned—these statements are representative of the judgments which a psychological observer is called upon to make.

The things reported upon are simple and direct matters of fact. The attitude is that of ordinary common-sense, though the objects of attention are slightly peculiar, as those of any science must be when regarded from the common-sense point of view. They are concerned with minutiae of mental process and habit which are always present in our reactions but to which we customarily pay no attention, because a knowledge of their intimate character is not necessary to the attainment of our practical ends. It is an inquiry into curious and apparently inconsequential matters, carried out with much attention to precision in defining the object and formulating the observation, which is monotonously repeated with an almost irritating patience. To this extent, but no more, may the psychologist's work be differentiated from the judgments and reactions of common life. There is nothing strange or abnormal in his mental attitude, nothing unique or unseizable in the processes he studies. No diremption within the self, no eversion of the contents of consciousness is called for, but only the sincere direction of a disciplined attention to just such matters as engage our every-day activities.

Reflective self-observation in all its forms involves certain characteristic difficulties, but these are merely incidental to the methods of science at large. For, in the bulk of its work, as has been pointed out, psychology depends upon a process which is not only as simple as the study of material things but actually identical in nature with the latter. To discriminate the lighter and heavier of two weights, to make one line equal in length to another, to observe the color of an exposed surface, to name the more agreeable of two tones, to recall and write down a series of numbers, to name the first object thought of when another has been named, to move in response to a signal or choose between one thing and another—these judgments and reactions involve no complicated acts of self-objectification, no difficult feat of introspective analysis. Yet it is just such observations as these which are being made in the routine of laboratory experimentation, and afford nine-tenths of the data for its conclusions.

The difficulties which psychology encounters, it may then be said, are identical with those of the descriptive sciences at large. They arise from two general sources: obscurities in the nature of the object under inspection, and disturbances in the observing mind. If the object of regard be complex, reflective analysis is made difficult, and the account which follows is likely to be imperfect. If it be evanescent, there may not be opportunity to observe its character with the accuracy necessary to an exact description. If too long delay occur before the observation is recorded, its features will have partially faded beyond recall.

Likewise, if the observer be fatigued or ill, disturbed or emotionally excited, the mental condition under which he works will interfere with his perception of the fact and his report upon it. The constitution of the various affective states, for example, and the changes which their history shows, have sometimes been regarded as a crucial instance of the psychologist's difficulties. But emotion is not unique in this regard. In just the same way, it is difficult to note the characteristics of fatigue, or to take account of an experience of any kind when disturbed or interrupted—as when one is in pain. It is not in consequence of the peculiar character of the phenomenon to be studied, but on account of the peculiar condition of the observer, that it is difficult to deal with such data. The disability is analogous to the influence of subjective bias upon the attempt to give an impartial account of any matter of fact. It is indeed to be doubted whether such states are among the more complex of our experiences. They seem rather to have a relatively elementary content and, therefore, to be susceptible of easy description.

As still another defect of psychological method is urged the fact that a mental event can be observed only by its subject. The individual must indeed be the final critic of his own observation, for he affirms only the reality of his experience as a subjective fact. The content of an hallucination is as real, psychologically, as that of a perception. If its subject ascribe objective validity to the experience, his claim may be disproved. If, on the other hand, he simply assert a visual apparition, his statement is beyond reach of attack. Only the subject himself can say whether or not the vision were actually seen; and, if seen, whether its nature were such as he described. While any such comment upon the quality of personal experience may of course be incorrect or false, it can be questioned only on the basis of discrepancy in the report itself, or in its relation to the objective system of behavior-attitudes from which an independent conclusion can be drawn.

Every element of the conscious life partakes of this subjective and unique character; but to conclude that the basis for an experimental approach to its study is thereby undermined, involves a misconception of the bearing of this fact upon the problem of psychology. In the first place, authenticity in the reports which each observer makes of his own experience must be postulated. By authenticity is here meant both honesty in the observer and care in making the observation. One must be trained in method and sincere in purpose. But this is a prerequisite of all scientific work, and has no especial bearing upon the problems of psychology. The only possible basis of coöperation in investigation is the assumption that the observer intends to report what he sees, and that the possibility of error is to be assumed only as a result of defective observation, not as the reflection of prejudice or intentional perversion.

The only questions which remain to be considered, therefore, concern the means of securing adequacy in the observation and of making its results generally accessible. The first of these considerations involves the whole problem of training in scientific observation, and of preventing or correcting such errors as are involved in the use of materials and the application of inductive methods. The treatment of this problem is a function of scientific method at large, and has no especial significance for psychology.

As to the second consideration, how the unique experience of an individual subject may be made accessible, the psychologist answers: by making each experience the object of direct observation and report. The uniqueness of the phenomenon as an element in a single stream of consciousness is irrelevant. The prerequisite for scientific coöperation is not immediate community of experience, but solely the development of a trustworthy medium for its communication and interpretation. In medicine, for example, the physician depends upon subjective as well as objective symptoms. He takes the pulse and temperature; but he also inquires concerning the existence of local discomfort, soreness, headache, nausea, and the like. None but the subject himself can experience the pain or giddiness. That, however, does not prevent the citation of such phenomena from having symptomatic value. Every observation of fact, whether of consciousness or of the external world, will be found to involve this psychological situation. Physical science equally with the study of mind depends on just such reports upon the content of immediate experience, on the part of different observers.

The only point, therefore, which is of importance to the psychologist is that reports should be based upon direct observation, instead of relying upon the interpretation of such physical changes as may unreflectively accompany consciousness. Dependence upon the latter—which in many cases is of course enforced by the nature of the subject matter—introduces a defect of method which increases with the subject's deviation from the norm represented by the observer. This is true whether the physical series of changes be an intended expression of the mental attitude, or merely its natural correlative. Expressive reactions of the first group constitute language; those of the second form behavior at large. Now while language affords an incomparably better means than articulate behavior for the expression of mental attitudes, it is still true that even its most discriminating use may fall short of the service expected.

The use of language involves two possible sources of error, one affecting its value as a means of expression, the other its value as a medium of communication. The conceptions which language embodies have a social origin. Their invention and extension reflect the need for communication which any people has felt, and are not necessarily coterminous with the scope of experience itself. Language is incapable of representing all subjective modifications, not on account of their intrinsic subtlety alone, but because it has not been fashioned for the complete interpretation of individual experience. Even in the case of a disciplined observer, this defect in the system of verbal symbols may take on serious proportions; but, in dealing with the untrained or immature, it becomes an obstacle of the first magnitude in securing an accurate and complete report.

If the observer find difficulty in the adequate verbal expression of experience, the hearer is exposed to a further error in his interpretation of the symbols used. The understanding of words springs from a social stimulus, which affects their use only when discrepancies in the meaning assigned to them by different individuals are thrust upon notice by the failure in mutual adaptation which results. Otherwise the divergence in interpretation may not come to light, the term being used with a distinct but undiscovered difference of meaning. Such variations in the individual use of language may be negligible in the laboratory, where each person is not only a trained observer but is also of the same mother-tongue and familiar with the terminology of his science. But, when the psychologist extends his inquiries to the untrained observer, who is unacquainted with the exact technical content of the terms used, the margin of error at once becomes serious. The general questionnaire is subject to gross forms of this defect.

Even within the ranks of technical students, the same difficulty arises when one is compelled to deal with reports in a foreign tongue. The general features of its terminology soon become familiar, but the more delicate shades of discrimination are lost. This defect pervades the whole interpretation when psychological analyses made by members of widely differing races are to be dealt with. The difficulty is illustrated in the misrepresentations which have crept into accounts of primitive cultures by foreign observers. Their whole view of life, extending to a multitude of individual conceptions, differs so much from that of the civilized world that it requires every device which ingenuity can frame to make the two series of conceptions commensurate. The failure to recognize such radical distinctions in psychological attitude and mode of expression has vitiated many reports of religious and political institutions, social ceremonies, and private life among savages.

The second form in which this limitation appears is a more serious obstacle to psychological inquiry than divergence in the use of speech. Reliance upon the data of general behavior occurs only when a dependence upon language is precluded. It is a last resort, where the subject either lacks knowledge of the use of signs at large or is at the time incapable of using them intelligently. In fever-delirium and drunkenness, in aphasia, insanity, and pathological states generally, the observer must fall back upon the facts of behavior; since the individual is either temporarily deprived of the power of speech, or is incapable of using it in a trustworthy manner.

For the mental reactions of the infant and all subhuman types, it is upon behavior alone that the psychologist depends for his data. If difficulties of interpretation arise even when the freest use is made of flexible human speech, the obstacles which the psychologist faces must be enormously increased when this faculty is lacking, and the observer relies wholly upon the stream of physical change in which the succession of mental attitudes finds an unreflective embodiment.

When the mind under inspection is closely related to that of the observer, the difficulty which a lack of speech involves may be surmountable. Approximate identity in physical structure and function, grounds the inference of important resemblances in the sensory content of experience and in the forms which reaction takes. It is the warrant also for an assumption of the existence of similar systems of kinaesthetic sensation and organic feeling, the basis of the sense of bodily adjustment and well-being. Including the detailed features of the central nervous system, such physical congruity in structure as well as function is the ground on which the existence of mental action at large is predicated.

When such resemblance is extensive, the interpretation of behavior proceeds with some security, as in one's general understanding of the attitudes of one's fellowmen. But, when one turns from the human species and its closely related forms to organisms far down in the scale, in which fundamental principles of structure have undergone alteration—when forms of movement exist which have no parallel in man's experience, and types of sensory organs occur whose function he cannot imagine—not only is procedure insecure, but the very applicability of terms descriptive of human experience is to be questioned. What sensations accompany the movements of wings a hundred times a second? What is the world like to a microscopic organism? How does it feel to be chopped up without being killed or stopping the regular metabolism of the body? What is experience when all differentiated structure is lacking? How does it feel to regrow a limb, to wear one's skeleton on the outside, to have one's sense-organs appear and disappear repeatedly in the course of life, to reproduce by division or to participate in conjugation? Such questions make the imagination stagger, for all speculation as to the quality of experience associated with conditions of life so radically differing from our own must be blind.

Under difficulties of this type, the psychologist labors throughout his study of animal behavior; for his interest is grounded in the phenomena of inner experience, not in physical structure and the form of reaction. For him, the latter have an instrumental value only, as means of approach to his own proper problems. Nevertheless, to these problems, adaptive behavior and expressive reaction form the only mode of access. His subjects not only lack a medium of communication but are incapable of even comprehending the nature of a sign, or understanding the situation in which they are placed.

Experimentation with a human subject involves little more than consent in participation, or the adoption of a critical attitude; but, in the case of the beast, it is impossible to arouse interest in the experiment, or to obtain coöperation in its aims. Attention must be secured through violent disturbance of the animal's natural condition, by arousing irritation or exposing to sudden stimulation, by inducing hunger or enforcing isolation. The very nature of systematic experimentation necessitates this procedure. The human subject, by identifying himself imaginatively with the investigator, voluntarily and intelligently coöperates in each test. But, in the case of lower animals, the systematic repetition of an experiment finds no such correlative in the attitude of the individual examined. The whole course of life flows on out of contact with the investigator and his aims. Either, then, the condition of the animal must be disturbed or the student must be content to observe the behavior of his subject unmodified, except by such changes as may be introduced into his surroundings without disturbing his natural attitudes and course of life.

There can be little question as to the relative value of reactions obtained under these respective conditions. But, when observation with non-interference is thus substituted for controlled experimentation, the student must be prepared to endure the consequences both of irregularity in the recurrence of the reaction and of complexity and variation in its concomitants. He may have to wait long for the accumulation of observations necessary to the formulation of his results; and he may find his interpretation embarrassed by the variety of factors involved in the situation he is studying. Either mode of approach may therefore be preferable, according to the particular phenomena to be studied. It is to be expected, therefore, that the two methods will continue to divide the field of comparative psychology between them.

In their positive elements, also, the methods of psychology and physical science are identical, as are the criteria by which their results are tested. Psychology seeks to formulate a system of descriptive concepts as a means of unifying mental phenomena. Its method must, therefore, be systematic and its criteria rigorous. Psychology is not represented in a set of individual comments upon the mental life, however exact and luminous. It seeks the data for such a connected account of that life as shall make possible the expression of its relations and conditions in definite law. The accumulation of observations is a necessary part of its work, but these are neither discursive nor of merely individual reference. Every psychological observation is guided by a theoretical concept. It springs from an hypothesis, and is a means to the verification of law. Proverbial wisdom represents a rudimentary stage in the development of science; for it rests satisfied with the characterization of individual features and reactions of the mind, without seeking to bring each activity into connection with the general system of mental phenomena.

The psychologist's method is thus determined by two considerations: first, that it is his general function to work out a systematic theory of the form and habits of the mind; and second, that, in each individual observation, he is to be guided by the concept of a specific relation which his inquiry is intended to test. The first requirement gives rise to the methods of theoretical psychology, the second to those of experimental psychology. In the systematic account of mental phenomena and their relations, at which theoretical psychology aims, is sought a basis of unity, not only in the constitution of the individual mind but also in that of the mental type and its development, by which the limits of normal variation may be defined and the comparison and classification of individuals and groups carried on.

The field of this systematic description is not restricted to the human type. The application of these theoretical concepts must be extended until the universal range of mental stimulation, correlation, and reaction has been brought within its scope. Psychology is a study of all phenomena in connection with which consciousness is predicated. As it considers any single reaction an instance of a typical function, so it views the individual mind in its totality as the modification of a common human norm, and conceives the human mind itself as a specific variety in the world of organic types at large. Its ideal aim may, therefore, be said to be an understanding of each element and function in its relation to the total system of the individual mind, and a determination of the historical connections of both function and type with their antecedents and conditions.

From the outset, therefore, the method of psychology must be comparative and statistical. Psychological inquiry carries the student at once beyond the single reaction and the individual mind to those general correspondences which mark function and type at large. Each judgment may be so affected by extraneous factors as to disguise the true psychological law involved. The observation of a single reaction, here as elsewhere, is an insufficient basis for generalization. The whole mental situation is in unstable equilibrium, and at any moment the constitution of either the inner or the outer group of factors may be so disturbed as to produce a wholly exceptional result. The physical condition at the moment, the idiosyncratic effect of a stimulus, the affective quality of consciousness which prevails, disturbances due to slight changes in the environment, even the uncontrollable shifting of attention itself, may transform the product of an experimental test.

While this is obviously true, it affects all experimentation alike, and is not peculiar to the field of psychology. Whenever the constant under determination is small in comparison with the accidental variables which combine with it, such anomalous results must be expected. But their correction is provided for in the general measures by which the elimination of errors is secured through repetition of the test under reciprocally varied conditions.

The importance of a statistical method in psychology appears not only in the necessity of repeating an observation until accidental errors are eliminated and the subject's normal reaction is determined, but also in the requirement that the results of any such series of judgments by an individual observer shall be brought into comparison with those obtained from other reactors. It is not the laws which characterize the activity of any one subject which psychology seeks, but those which hold true of all; or rather it is the business of psychology to determine the frequency curves of the system of variants comprised within the field of observation. As a single judgment is insufficient to reveal the individual type, so is the study of a single individual inadequate to establish a norm for the group to which it belongs, whether determined by age, sex, race, species, or what not.

Psychology, like all science, is concerned only with the type, which it defines in terms of abstract conceptions. This holds true whether the results reflect the unity of a series of reactions in the experience of a single individual, or be based upon a comparative study of many individuals and embody the norm of a larger or smaller group. It is biography which undertakes a study of the individual as such, and sets forth his inner life as a significant spiritual activity. Biography, therefore, is not part of science but a form of art. It differs from fiction in the unity of its historical data, but possesses the same fundamental point of view and method.

The psychologist is, therefore, under the necessity of supplementing the introspection of his own individual experience by the accumulation of observations concerning the modifications which any series of individuals presents. It is only through the collection of these statistical results that averages and deviations can be determined, and the conception of a norm formulated. The basis of comparison among individuals must, therefore, be sufficiently wide, and the repetitions of each observation sufficiently numerous, to ensure the elimination of all errors due to merely incidental factors of disturbance. The value of these quantities is of course indeterminate. The number of repetitions necessary in any individual case, for example, is contingent upon the magnitude of the factors of variation which are involved. The errors, also, are of many kinds. Disturbances due to the space and time relations under which experimentation is carried on must be eliminated. The effects of general physical stimulation and mental agitation must be allowed for. Disturbances of attention must be taken into account, and an anticipation of the result on the part of the observer avoided.

The form of instruction to the reactor needs constantly to be scrutinized in order to avoid misconception, with its consequent effects upon the character of the reaction. Similar regulations must guide the investigator in the treatment of his results; for any series of observations may be dealt with in such a way as to obscure altogether its real significance. For example, it may be necessary to express the result in a series of types instead of a single norm, in order to avoid a blotting out of characteristic features through the cancellation-effects of errors of opposite sign which mark two subgroups in the same continuous series. The direction and extent of all such subdivision must be determined by considerations of utility, the nature of which cannot be stated apart from a knowledge of the individual problem at issue.

To the task of theoretical psychology, experimentation bears the relation of means to end. The requirements of method in this field are wholly special. They prescribe the conditions under which any particular hypothesis must be formulated and verified, including the use of safeguards by which each particular test is secured against vitiating errors. The development of this technique is the task of experimental science at large, and psychology contributes to it nothing essentially new. Its features can be indicated in a few words, as the general nature of scientific method has already been discussed.

Experimental method is the systematic development of those guiding rules which are employed by common-sense in the protection of its practical observations. It seeks precision, economy, and certainty in its procedure. To this end, it endeavors, first, to simplify its problem, so that a single objective of the greatest practical definition shall be set before the mind; secondly, to become so thoroughly aware of the conditions involved in its test that extraneous and confusing elements shall be eliminated or compensated for; and thirdly, to secure such control over its materials that each experiment may be repeated at will, as a general basis of comparison in the verification or correction of a succession of independent tests. In proportion as these desiderata are realized, the experimental approach to any problem will be direct and secure, its procedure freed from suspicion, and its conclusions authoritative and convincing.

The method of casual or unassisted observation is defective in all these regards. The observer is at the mercy of external circumstances, both as to the conditions under which the phenomenon is presented and the frequency of its recurrence. The general plexus of events with which it is interwoven, and the number of factors directly combining to produce it, make a logical disentanglement of the succession of effects impracticable. Reflective analysis is effective only when supplemented by a separation in fact. The cause which has been isolated in imagination must be applied in approximate freedom from complications if its operations in nature are to be traced successfully.

In the unmodified flow of events, it is commonly impossible to analyze the system of causal antecedents which conditions any phenomenon. The consequence is that the results of our unassisted observation can be expressed only in terms of rough probabilities, and thus form the folk-lore of science. It is the first task of experimental method to eliminate the confusing multitude of factors which, in ordinary experience, are associated in a single concrete process, and, by an arbitrary control of events, to secure the isolation of that element which alone is to be studied. It separates and puts aside other problems, however closely allied to the point at issue, in order that attention may be concentrated upon a single specific question.

As no solitary observation can be so guarded as to make the whole system of conditions affecting it absolutely clear, the repetition at will of the observation upon which any conclusion rests is essential to the establishment of scientific law. Exact records must be made and accumulated as the material condition of any general conclusion. When phenomena which are beyond the observer's control occur only at long intervals of time, the work of many successive generations may be necessary to the establishment of a single law. With increasing frequency in the recurrence of an event go not only an earlier solution of the problem it presents, but also a greater continuity of the intellectual problem and a higher definition of its character. Ideally the continuity of interest in a given problem should not be broken between its formulation and its solution; and the series of observations upon which the latter depends should be repeatable at the will of the investigator.

Experimental method seeks to bring the whole set of conditions involved in the problem within the control of the observer. Such control is of course impossible so long as the occurrence retains its place as a natural event in the system of the external world. It is, therefore, the task of experimentation to introduce an artificial simplification into the procedure of science, while retaining the essential features of the phenomenon to be investigated. It must devise a schematic representation of reality, so true to the original that the results obtained from employing this conventional rearrangement as its material shall be applicable to the event as it appears in its natural form and relations. It is this task, in its illimitable modifications to meet the variety of individual problems, that engages the chief energies of the experimentalist. To schematize his materials and to devise simple, controllable means of employing them; to reduce the problem to its elementary form and yet to preserve the integrity of his aim, so that the results of his conventionalized tests shall be valid in all their practical applications—such is the significant and exacting task of experimentation.

At the same time, the ultimate criterion of method in any field of knowledge is its service in the discovery of truth. Whatever mode of approach furthers that end is legitimate; for science has no royal road. It avails itself of many devices, and submits each to the same final test. If the artificial simplifications of experience employed in laboratory experimentation serve to establish the laws of mental action, their plasticity and freedom from complications make them invaluable instruments of psychological investigation. If certain forms of experience cannot readily be subjected to an experimental test, they must be observed as they occur in the natural successions of mental life. If a statistical inquiry will reveal the presence of mental constituents or the form of mental reactions which an observation limited to a single subject is inadequate to determine, the application of the test must be extended until the group is ample enough to establish the specific features of the reaction in question. If a study of mental development can show us the rationale of habits which in the adult consciousness appear as pure idiosyncrasies, the genetic study of mind should supplement an inquiry into its present constitution. If laboratory experimentation involves any essential disturbance of the phenomenon, the psychologist must lay aside his plan of formal simplification and study the event under its natural conditions, accepting whatever complication the change introduces into his problem.

The development of technical method has brought the field of psychological investigation into closer relations throughout all its parts. The study of mental activities is no longer divisible into two opposed methods, subjective and objective—the one depending upon a reflective introspection concerning the observer's own mental processes, the other relying upon an examination of complex human products in literature and art, law and custom, tools and materials. This approximation may perhaps be expressed by saying that the experimental approach has replaced both of these methods. Instead of introspection, reaction to stimuli has become the psychologist's ideal method. This takes as many forms as the variety of circumstances may call for, in sensory discrimination, judgments of space- and time-magnitudes, physical reactions, choices, recall and reproduction, etc. In each case, a basis of judgment is sought in the response to a specific stimulus so chosen as to reveal, by its systematic modifications, the law of the activity in question.

In this procedure, the conditions under which the mind works are schematized, and each significant element is studied in a series of artificially simplified examples, which are systematically varied in such a way as to develop in succession the several factors involved in a study of the problem. It is the aim of psychology to make this substitution of laboratory experimentation throughout the field within which, at an earlier stage in the development of method, simple occasional introspection was dominant.

A similar methodological assumption has become the psychologist's working hypothesis in the field of objective research—in the study of human products as opposed to processes of mind. The typical forms of mental organization which underlie production in the various fields of fine art, for example, were first subjected to indirect scrutiny through an inspection of the complex results of human activity themselves. Cathedrals and tombs, sculptures and statues, paintings and engravings, were examined and measured, the relations of lines and masses, units and compositions, being studied in their psychological significance as expressions of human ideals and preferences. The result was a determination, or at least a suggestion, of the universal presence of definite principles of subjective selection and organization. These were found in the construction of ground-plans, in the relation of support to superimposed mass, of column width to intracolumnar space, etc.—principles of unity, proportion, repetition, variation, enriched and complicated by a thousand modifications and accessories.

A clear realization of the systematic place which such principles of aesthetic selection and organization hold in all the allied fields of art, sufficed to ensure a general extension of the methods of study in this field, in such a way as to bring it within the scope of scientific investigation. As in the case of introspective study, this modification consisted in a process of schematization. The materials and forms in which the human mind has expressed itself in this field, were simplified in such a way as to make possible an approach through laboratory experimentation. Simple lines and forms, masses and spaces, colors and shadows standing in elementary spatial relations, were substituted for the bewildering complexity of architectural monuments. Hammer or bell strokes, varied in intensity and temporal arrangement, replaced the rich and subtle relations of musical composition. In a word, there was everywhere substituted for the original phenomenon, in this development of method, an artificially simplified object of reaction which might be presented under conditions of experimental control. The two extremes of the psychological field were thus brought into contact and made subject to a common method.

The same is true of all similar classes of psychological data. The extent to which any system of human products has been subjected to this procedure will obviously depend upon the complexity of its materials and the amount of sustained attention which has been given to its problems. In its application to the data of education, for example, psychological method has been developed more systematically than in the treatment of economic phenomena; but such differences are due merely to the historical conditions under which knowledge has arisen in these respective fields. It is in such application of strictly experimental procedure to all the complex phenomena of human association that the greatest advances of psychology in the immediate future are to be expected.

The value of all such modification of procedure lies in the fact that it simplifies the problem, and makes the test more controllable. One not only sees more clearly what is dealt with under these conditions, but can also state more definitely what has been observed. One excludes as many as possible of those inessential concomitants which everywhere enter into the situations of actual life and complicate the reactions of the mind. One studies the response as it occurs, choosing the simplest possible stimulus and modifying it to suit each new development as the investigation proceeds. One repeats the test until the quantitative distribution of the reactions can be seen, and its mode and limits determined for the individual or the group.

As a result of this procedure, the problem is given a more orderly and manageable form; the comparisons made are specific, each having a definite bearing upon the point at issue; and the reactions obtained may be arranged in series to show norms and variations. It is thus sought to give an exact meaning to the statement of problems and to the formulation of conclusions, so that any piece of work may be tested by a repetition of the observation under conditions which shall allow a specific comparison of its results with the original findings. From this point of view, the essentials of method amount to a regard for three things: first, a dissociation of the problem into as many and specific factors as possible; second, a systematic variation of the test by which any such factor is explored; and finally, a serial arrangement of the reactions to show the distribution of variations.

It is in the results of this procedure that a settlement is to be found of the controversy as to whether the method of quantitative comparison can be employed in psychology. It may be freely admitted that the reactions of common life—which reflect both the past history of the self and the whole stimulus-complex of the moment—can neither be compared nor quantified. But psychology no more attempts this task than physical science undertakes to write a specific equation representing the totality of conditions and forces involved in any material change. In giving a precise meaning to research, the initial act is the same in these two cases. It is a logical analysis of the situation accompanied by a concrete isolation of some particular constituent of the complex whole, either in its original form or in that of a schematized substitute.

If the objection be renewed that the simplest modification of consciousness is no more quantifiable than are complex reactions and their products, because the differences in question in any such case are purely qualitative, it may at once be answered that the assertion is true but that it is not relevant. The immediate quality of reality in this sense is no more involved in mental than in physical science. We cannot say that the difference between two just discriminable high notes is the same as the difference between two just discriminable low notes, or that it is equal to the latter, or quantitatively greater or less than it. There is even less meaning in such an attempt than in the endeavor to equate the unitary values of two self-systems, as in comparing the creative artistic genius represented in the composition of Beethoven's Ninth Symphony and in the painting of the Sistine Madonna.

Further, we cannot say, in this meaning of the term, whether the difference between any pair of tones which two persons alike find just discriminable is the same for those who thus detect it. And the psychologist finds it equally impossible to make such a comparison in all cases. But he *can* observe whether the same two notes were just discriminable for any two persons, or whether the requisite interval was greater in the one case than in the other. And—intending a precise meaning by his words—he may say that, in the former case, the discrimination-thresholds are equal, while, in the latter, one is higher than the other. Further, he may arrange an extended series of interval-differences and, with this scale of tones, determine the reaction of each individual, in the sense that there will be assignable to him a specific relative position in the whole series which the group of individuals composes, and that his reaction may be discriminated from that of any one of his neighbors by indicating the magnitude of the interval which separates the respective stimuli to which they responded.

In this sense, mental differences are not merely recognizable and discriminable; they are quantitatively comparable. And it is in the making of just such measurements and correlations of the variations which appear in the reactions of an individual or a group that psychological research is engaged. It measures perception in units of duration, extension, or specific quality, by the time required to recognize an object, or by the number and diversity of the things apprehended. It measures memory by the number of repetitions necessitated in the learning process, or by the amount immediately reproduced or retained after a given interval. It measures complication factors by the retardation caused in the reaction, or by the amount and direction of the disturbance introduced. It measures ability by giving to the term a specific content and determining, in relation to this selected activity, the rate, amount, or quality of the product in each individual case. And so on throughout the uncountable modifications of the psychologist's problem. The quantitative treatment of its data is thus not merely feasible but obligatory for mental science. The nature of its materials in no way obstructs its application; and advance in any part of its field is measurable in terms of its success in achieving this ideal.

The development of this point of view as a working procedure depends, of course, upon the elaboration of a system of statistical and quantitative conceptions, and their adaptation to specific classes of materials and experimental aims. In actual research, success in any individual case is intimately dependent upon the ability to seize upon the particular conceptions and forms of measurement which the nature of the problem demands. One must determine whether the mode, the average, or the mean, shall be used in stating any result. One must know whether variability is more clearly represented in terms of the probable error, or by percentile grades; and, in the latter case, whether the quartile, octile, or other values are to be preferred. One must understand the utility of the method of right and wrong cases in one connection and of just perceptible differences in another, and so on. But none of these matters properly enters into a consideration of the general problems of psychological method; they are all questions which it is the province of the manual of practical experimentation to formulate and discuss.

## CHAPTER XI

## THE DATA OF PSYCHOLOGY

THE immediate data of consciousness, it has already been pointed out, afford materials for two wholly different reactions. It is essential that the distinction between these characteristic modes of treating the content of intuition should be held in mind, if a proper conception of the data of psychology is to be reached. For, of these two attitudes, it is the non-psychological which we assume with the greater facility, because it represents the immediate reaction of the naïve self upon its object. The moment, therefore, that we fail to hold fast to the technical aims of psychology, its conceptual viewpoint lapses, and the content of experience is once more treated in terms of its original and immediate values.

In its primary significance, the objective world is a system of materials—plastic yet resistant—through which the aims of the practical and moral will are realized. Especially in its human and social aspect is the objective world thus conceived. The existence of our fellow-men is the habitual postulate of our own self-expression, which finds in them the sources of its inspiration, the materials for its development, and the ideal prototypes of its constructive activities. This reaction upon experience is not confined to moments of uncritical self-seeking or dumb appreciation, but appears also in the systematic treatment of its materials under definite ideal criteria.

In its immediate bearing upon the problems of psychology, this non-scientific viewpoint represents an interest in the individual mind and its history, as a significant system of attitudes. The principle appears under a variety of aspects. Biographical study, for example, is an attempt to interpret and reconstruct the form of experience in some particular human life, to discover its fundamental motives and modes of working, its ideals and hindrances, in order that the succession of attitudes and decisions in which it was expressed may be made intelligible and coherent. In the execution of its own proper function, this point of view is not even brought into contact with the scientific problems of defining and assembling data, determining resemblances and differences, establishing averages, formulating and verifying explanatory hypotheses, and so on. Biography —and philosophical history at large—make use of scientific conceptions and methods only in the original sifting of their data, that is, in establishing the authenticity of historical materials. Their utilization in that interpretative reconstruction of a past experience, in which the essence of all human history lies, not only cannot be adequately prosecuted by the methods of science but involves conceptions and aims for which science has not even a terminology.

Biographical interest, whether in mental constitutions and reactions, in events, or in cultural materials and changes, centers upon their significance in the unity of experience and its ideal development. The historian of a people, or of any cultural system, likewise conceives his data, it need hardly be said, in the light of a spiritually significant process. It is just the task of the historian, through the energy of his creative imagination, to reconstruct from documents, tradition, arts, and the like, a concrete vision of the life of races and cultures that have passed away; and to convey to us, with the illusion of reality, a sense of its intrinsic values and meaning.

These historical materials are, of course, also exploited by the scientist who makes comparative studies of the records, subjects them to statistical treatment, determines identities or resemblances of type, and traces their historical genesis, dispersion, and decay. In all this, truth is indeed being sifted from error and the general basis of all historical study circumstantially established. But the procedure is no more to be identified with the reconstruction of human history itself than is science to be confounded with metaphysics, because it is engaged in continuously elaborating that knowledge of phenomena which it is the function of philosophical reflection at large to interpret and appraise.

In this regard, the standpoint of fiction is identical with that of biography and history. The novelist or dramatist is engaged in imaginatively constructing the life of a fictitious individual or social group, in which mental constitutions, attitudes of will, reactions and their consequences, are logically developed in a series of dramatic situations. The literary artist reveals to us in a specific concrete form the influence of fundamental instincts and obscure passions or motives upon decisions of the will, the opposition of clashing human interests or aims, and the complications which objective change introduces into human fate.

Our attention is habitually gripped by these spectacles because they are the objectification of our own existence. Through this intellectual mirage, we look upon the original and passionate forces constituting the substance of our own being, in a detached and projected vision. In dramatic representation, that sting which makes the direct observation of reality too poignant for pleasure has been removed; and our comprehension is aided by a conventional simplification of the will-relations involved. In view of this, it may be urged that the novelist is concerned with mental generalizations and the tracing of causal and genetic relations within human experience, that he is engaged in defining characteristic types and developing the logic of action and its consequences.

But in all this—while it obviously affords the highest scope for every element of mental endowment—a psychological treatment of the data is nowhere involved. Literary fiction is an imaginative addition to the materials of intuition, which, from its very nature, can do no more than enlarge the concrete illustrations upon which the psychologist draws. To make use of fiction at all, its fidelity to life must be assumed—of which it is at best a pale reflection; and what it does, through its dramatic isolation and exaggeration of the classic features of experience, is to suggest problems which can be solved only by a return to the direct observation of that experience in its original flow. In other words, as will be pointed out later, the literary imagination in fiction, drama, and poetry, provides a mass of psychological data, stimulating and varied, as is every product of man's creative invention; but does not, in any sense, attain a system of psychological conclusions.

If our interest in pure literature be characteristically aesthetic, that which attracts us in biography and history for the most part has a wider and genuinely human ground. The contemplation of the mind in action, under all the conditions of actuality, may afford pleasure as a pure spectacle. Its characteristic reactions, its ingenuity and resource in meeting problems, the pathos or tragedy of its fate, may stimulate and satisfy the dramatic imagination. But behind it all lies the interest in everything which touches our own existence.

All picturing of human life, in literature as well as in history, has this bearing upon our own practical and moral problems. It extends and vivifies experience for us, and thereby helps to perfect our reaction upon the world, making us see more clearly the grounds and consequences of action. The service which our constructive imagination renders to intelligent conduct, in reviewing and analyzing the situations we encounter in daily life, is supplemented by dramatic artifice in fiction, and by the sympathetic interpretations of biography. The approach is indirect, but its value is second only to immediate personal contact as a source of inspiration. In the record of other men's lives, we find both stimulation and directive forces, capable of energizing and moulding our own moral wills.

In its final aspect, this individualizing study of mind appears as a general postulate of social adaptation. The habitual mental reactions of other individuals must be studied, as a condition of our own attitude, in all the relations we sustain with them in common intercourse. Whether permanent or incidental in character, the maintenance of these associations depends upon mutual understanding and the reciprocal adaptation of behavior. The variations of individual quality and attitude which our social reactions thus encounter, are legion; and it is man's most engrossing occupation to study their nature and bearing upon his own circle of interests.

In all these cases, a serious intellectual occupation is involved. The study of mind is systematic as well as sustained, and its outcome is of the highest significance for all our moral and social aims. It occupies an incomparably greater place in human activity than that interest which technical psychology represents. Such study, however, differs essentially from the undertaking of science; since the mind, in these cases, is conceived as a system of teleological attitudes expressing the ideal values of experience.

It is life and its meaning which are studied in this endeavor to clarify the aesthetic or practical ideals of the will. These aims and reactions, these judgments of value and spiritual enterprizes, in which the root of self-existence lies, it is the function of philosophical reflection to bring into coherent form and subject to critical appraisal. But with them, as pointed out in an earlier chapter, science can have nothing to do, since the values of experience at large are irreducible in its terms. These vital preferences and passionate affirmations of the self are the very substance of intuitive reality. But, just on that account, they are psychologically unseizable; for mental science can give an account only of the mechanism upon which they depend and the historical conditions under which they arise.

The second general type of interest is represented in the psychological study of mental life. In all its special modifications, the main features of this motive remain essentially unchanged. It treats the mind as a succession of connected states or phenomena, whose uniformities are to be determined and expressed in general laws. To say that psychology is the systematic study of mind, is not sufficient. We have seen that the historian and artist also seek an understanding of the mind, whether it is to be sympathetically interpreted as a significant spiritual process or treated as plastic to certain ideal forces which, in imagination or practically, are brought to bear upon it. The two attitudes must, therefore, be discriminated in terms of their characteristic conceptions.

Psychology is not concerned with an understanding of the individual mind from within, so to speak, as a system of significant experiences, having meaning and value both for the subject himself and for those who come into contact with him. The knowledge which psychology seeks may be described as an understanding of the mind from without, in terms of its homologation with other minds, through the establishment of common types and conditions of reaction. It seeks to bring each phenomenon into correlation with the system to which it belongs. What interests the psychological student is not individual experience as such, but the nature of its material content. It is not the significance of any event as a moment in the life of a self, but its historical conditions and the law of its occurrence. It is not the character of the subject as a unique system, but the features and reactions which each subject shares with other minds.

The psychologist may, of course, confine his attention to a single mind, but only in so far as the material it affords permits him to apply his own technical methods. In the determination of any mental law, the experimenter may either ask the same individual to repeat an observation already made, or turn to another for its repetition. If the inquiry be limited to a single subject, it is the law of occurrence within that mental system alone which it serves to establish. If its range be extended to a series of individuals, the law for the group which they compose is determined. In this way only can the study of the individual be approached from the scientific standpoint. For the mind's existence as a significant unity of experience, the psychologist substitutes the conception of a system of phenomena whose relations are to be expressed in terms of general concepts. The results appear as a series of characterizations and laws which reflect the uniformities of occurrence within the field in question.

A systematic psychology of the individual mind may thus be conceived, since the form and conditions of its activities are ascertainable and may be expressed in a series of concepts. Such a thoroughgoing study of the individual mind, in some one or other of its special aspects, is an important element of special method in the hands of the investigator. Among studies of permanent value in psychology are not a few which have methodically depended upon an exhaustive examination of a mental trait or activity as it appeared in the experience of an individual subject. A single mental history studied in this way may be more illuminating than observations on many minds, if made without an adequate inquiry into the nature and conditions of the phenomenon.

Yet the value of all such studies lies ultimately in their extra-individual reference. The significance attributed to them rests upon the belief that the laws they reveal are not limited to the individual mind in question, but express the essential form of that mental activity within a specific social group or throughout the human type at large. We value each piece of systematic introspective observation because of the feeling that a fundamental identity pervades all the minds of this common group, and that, through a thorough analysis of any one, the structural features of the type may be determined.

The necessity of exploring every variety of mental constitution does not begin with the study of racial characteristics, or modifications due to age, sex, and the like; while it is at the same time obvious that such a review is indispensable to any psychology of types. Nor is its importance felt for the first time when an examination of abnormal and defective forms of consciousness is undertaken; though, until the accumulation of such studies, the actual range and diversity of these phenomena were scarcely suspected. It is not even as a requisite for the establishment of normal types, through a determination of the quantitative distribution of individual reactions, that this necessity may be said first to appear, but in the elementary differentiation of minds in qualitative make-up itself.

The recognition of this fact may indeed be said to give to psychology its characteristic point of view. While common-sense asserts that each person of a group looking at any object perceives the same thing, psychology seizes upon the fact that each has before him a different and—in its total form-quality—a wholly unique thing. Common-sense concerns itself only with the knowledge afforded by the senses, but psychology is interested in the mental reaction itself which is involved in any such activity of knowledge. What it notes is not the properties of things, but the qualities of sensation; not the organic unity of parts in the object, but the mental synthesis in the perception of it; not the common objective characteristics of the sensible world, but the specific differences which mark the reactions of individual consciousness to its stimuli.

Practically and epistemologically, we are dealing with a system of objects, to the conception of which we endeavor to give the greatest possible distinctness and permanence. Subjectively and psychologically, we confront a fluid multiplicity of qualities and forms of reaction, the variety of which we can know only through persistent exploration of our own experience no less than that of others. Because we intend the same thing, it is assumed by common-sense that our representations of it are alike. Because our accounts square and we can keep appointments, because we understand one another, reach common conclusions and coöperate socially, it seems as if we must have similar conceptions and think in the same terms.

This mode of reasoning has been an immemorial tradition among men, and is entrenched in a multitude of false conceptions which have yielded only slowly before the advance of a psychological view of reality. It appears in the belief that the child is a miniature adult, in immutable and rigoristic moralities, in the underlying assumptions of "rational" psychology. It pervades the doctrine of classicism in art, the principle of religious conformity, the conception of the "economic man," perhaps even that of the "normal" individual in practical psychology.

The most elementary requirement in understanding the psychological point of view is to free the mind from all notion of that common objective reference which the reactions of any group may possess, and to become receptive to the immediate subjective differences they present. In psychology, the original sin is to create another's mind in the image of one's own; and hard upon it follows that of thinking all minds alike which have a common aim or draw the same conclusion. As well might one say, because two persons had reached a certain spot together, that they must have come from the same direction or travelled in similar ways. From the outset, it is necessary to keep in mind that the psychologist is a recorder, not a legislator, and undertakes a wholly empirical study of that complex and variable existence, the individual mind.

This it is which makes the maintenance of what may be called a purely experimental attitude toward experience, imperative. The psychologist must have no preconceptions which, by filling the imagination with an abstract type, shall limit his expectation or blind him to the actual variations which subjective reality presents. This possibility of an endless series of patterns and modes is to be postulated, not merely in the quantitative manifestation of any element, but in qualitative constitution itself. One's own experience is always an inadequate basis for construing the material content of another mind; for there is no particular of quality or action, in which individuals may not differ. The name of an object rouses an image in one mind of its visible form; in another, of its tangible existence—weight, surface-texture, or what not; in a third, of its taste or its odor. In still another, it is some typical way of dealing with the object, and its results. When a verbal term is thought of, it is seen in imagination by one, heard by another, uttered by a third, and perhaps written by a fourth.

As modifications of consciousness, these various reactions have scarcely an element in common, and are held together solely by their objective reference. One who reacts constitutionally in a specific way, may be wholly incapable of deriving from his own experience a representation of the many other forms of response which actually exist. But, as it is the aim of psychology to develop this whole system of individual variations, it is just this knowledge of other mental patterns and habits of thought, of unfamiliar qualities of feeling and impulse, of strange motives and aims, which must be sought. The psychological attitude requires an avoidance of the assumption that one's own mind is either the sole type or the normal type, and an habitual expectation of unpredictable qualities of experience or modes of reaction in the course of research.

These novelties are not confined to mental pathology or to the remote borderland of experience. In the normal consciousness itself, an endless complex of phenomena appears as it is subjected to systematic examination, and new methods of dissociating its activities are elaborated. The general mechanism of the mind's reactions is largely invisible to the subject himself. He notes the more obvious qualities of experience, its more striking stimuli, its more interesting reactions. But, of the complexity of its constitution, he may know very little; and of the way in which its elements interact, or of the range of stimuli it reflects, he may have learned practically nothing. The feelings which arise from organic conditions, for example, commonly fuse to produce a general background of consciousness which is vaguely recognized in the sense of physical well-being or malaise. The total stimulation which pours in from the external world at every moment, is apprehended only in so far as it disturbs the activity of consciousness, or produces a cumulative effect in fatigue.

In dealing with any theoretical or practical problem, it is only the conditions or premises, and the final reaction or conclusion, which are remembered. Of that complicated chart which the mental dialectic reveals, little is even suspected in the absence of a specifically psychological interest. The man in the street, for example, cannot tell what classes of things habitually distract his attention, what impulsions and inhibitions determine his trivial preferences, what directions the expression of his *amour propre* takes. Nor can he describe his method of recalling some forgotten name, or of learning or unlearning a particular reaction. Nevertheless, in each such case, a specific series of acts is involved, which not only tends to reassert itself on successive occasions, but also possesses a unique twist which marks the individual off from his fellows.

Psychological interest embraces this whole system of submerged relations and interactions, between element and element of the conscious life, and between its unitary attitudes and the objective or historical conditions under which they arise. The data which a normal life offers to introspective analysis and experimental determination, are thus of incomparably greater range than casual observation could possibly reveal. Much of it is hidden, as the nervous structures or chemical reactions of living tissues are hidden from the unaided eye. The general mechanism of consciousness must thus be lifted into the light and subjected to experimental dissociation, until its constitution and dynamic relations have been established in detail. This exploration has been stimulated not only by the experimentalist's interest in normal phenomena, but also through the application within that field of conceptions developed by medical psychology and the study of psychopathology.

When, from this analysis of individual experience, one turns to the varieties of mental pattern and habit which the members of any group, or the various classes, ages, and races of men present, the problem of psychological data is raised to a higher power, and new horizons of diversity appear. If the individual be a complex unity in which any succession of moments presents a series of dominant motives, each representing a new selective and organizing principle and resulting in a novel combination of materials, then any group of individuals will present a system of such self-reconstructive units, each complex within itself but entering as a constituent into the equilibria of a still more complicated field of mobile and variable forces. Yet it is just this interacting system in its totality to which psychological inquiry is ultimately directed. Its aim is to determine the whole range of variations which individual minds present, and to exhibit the network of associations in which they exist or act, in its objective and social as well as its subjective and intrinsic aspects.

The study of mental processes in any individual mind, however painstaking and thorough, is therefore but a contribution to the solution of a psychological problem. It makes possible a tentative formulation of law, and guides the student in his subsequent study. It is both an example of method and a suggestion as to problems. It is insufficient to determine the locus of the norm and its own relation to it; but it is at least a point of origin from which, in the development of his particular problem, the student may work. Since introspection makes known the habits of an individual mind alone, it affords no adequate basis for induction concerning the form of any activity within the group to which it belongs.

The experience of the ordinary sane individual does, of course, embrace within its swing the data for at least a beginning of the inquiry concerning the range of normal variations, and even of pathological mental states. His responses are, in general, well coördinated and adaptive. The flow of ideas is a consistent reaction of intelligence to its objects. Baseless psychic compulsions and emotions are absent. The decisions of the will reflect an orderly and characteristic system of motives. But this holds true only for the flow of experience in its wholeness. The closer one's inspection of his own mental constitution and reactions, the wider the margin of subjective variability and the more common the interruptions of associative integrity are seen to be.

The meaningless impulsions and momentary states of disaggregation which occur in every-day life to all of us, the sporadic substitutions and reversions of association, the primitive or irrational trends which appear in our preferential reactions, are commonly overlooked or suppressed in memory. Unless a distinct psychological interest be involved, or the occurrence possess a distressing intensity, these experiences do not attract even a momentary attention. But the phenomena are there just the same; the fringe of every life overlaps the abnormal. An individual is sane not in the sense that the elements of insanity—its associative incoherences, its exaltation of affective tone, its perversions of stimulation and idiosyncratic forms of reaction—are absent; but only to the extent that, in the experience of such a self, all these features appear as exceptions or momentary interruptions of a more orderly ideal system and a sustained habit of objective and social adaptation.

All such departures from the characteristic reactions of normal selfhood, occurring within the experience of a sane individual, are potentially observable by the subject himself. The study of variation thus finds both ground and material in purely individualistic observation. But, since it determines merely the limits for that self-system alone, it suggests, but cannot solve, the more general psychological problem, which depends upon comparative methods. Further, as the disturbance of psychic equilibrium increases, and the divergence in any quality or reaction of consciousness verges more towards the pathological, the introspective activity as well as its material is affected. The original quality of experience is refracted more and more by its passage through the ideal complexes which are dominant in the observer's life.

When viewed in this light—that is, when regarded as aberrations—these phenomena are subordinated and minimized in the general review of experience. They may indeed receive a wholly fictitious relation and meaning, through a defensive reaction which literally partakes of the nature of delusional interpretation. Even when the general grounds of judgment are not affected, as they are in pathological conditions, the system of acquired conceptions and individual or social valuations interposes a distorting medium, which makes a psychologically acceptable report upon experience more and more difficult as the index of variation increases. In this progression, a limit will obviously be reached beyond which the materials afforded by experience can no longer be approached by the method of direct observation.

To establish the distribution of reactions for any class or race, sex or age, or for a group possessing any special aptitude and training, or suffering under a particular defect or disease, it is, therefore, necessary to supplement the study of any individual mind by a comparison of its modes of activity with those which appear elsewhere within the group. For this supplementary series of observations the psychological student is dependent upon the objective expressions of mind, since all immediate access to its phenomena is excluded.

Such expressions admit of two general principles of division, first, according to the relation which the expression bears to the attitude of the self; and second, according to the form of the product in which the function is expressed. The first principle gives rise to two classes of data, intended and unintended manifestations of mind. These also have been called primary and secondary self-consciousness, or unreflective and reflective modes of expression. The first comprises all those forms of reaction which are designed to make known the mental content as such. The second class is composed of all those which arise when the self is concerned with some other object than the report of its own experience.

Application of the second principle of division likewise gives two classes of data, primary and secondary expressions of mind. By primary expressions of mind is meant the whole system of reactions by which the subjective content and attitude are made known, whether these reactions be intended specifically to reveal such attitude or not. By secondary expressions of mind is meant that system of permanent objective products in which mind embodies its aims and values. These two classes of data may be called respectively, for the sake of convenience, the functions and products of mind.

It is with the primary expressions of mental activity in their intended form, that psychology is chiefly concerned. Next to immediate introspection, it brings the student into the closest possible relation to his material. This class of psychological data takes the form of an interpreted reaction, the report of an individual concerning his own experience. The fact with which it deals is immediately known, not dramatically reconstructed, as it must be by the observer who depends upon the objective products of mind. Along with the reaction is given its meaning or connections in experience for the subject who made it. Each situation is thus accompanied by an illuminative context of comment.

The only questions which affect the value of the result in such cases, are those of the individual's qualification to make the observation and the ambiguity which may obscure his language. The observer must be able to seize the essential aspect of the phenomenon, and his comment must be pertinent to the inquiry. In other words, the psychological point of view must be understood and critically applied, a requirement which implies both a general discipline and an intelligent regard for the point at issue.

The psychological attitude is, in a sense, exceptional. The record of its observations is thus hampered by discrepancies between its technical aims and the meanings which common speech intends. To give a full and accurate account in such a case needs alertness and vigilance, a scientific interest in experience, and a capacity for disciplined attention. In connection with this class of data, therefore, there remain only those forms of defect to which observation of mental processes is in general susceptible. The errors of introspection once allowed for, such primary intended expressions of mind may be treated unconditionally as psychological data; for both sincerity in the observer and a mutual understanding of the symbols of language are to be assumed.

In all other cases, in which such first-hand explanation and report are lacking, the data require interpretation at the hands of the psychologist. The reaction appears as an intelligent adaptation, or as a mechanical response to some change in the external world. Its specific correlative in consciousness must be constructively established by the observer, who thus creates the psychological observation himself by translating the reaction into subjective terms. A twofold source of error thus enters into the observation of such phenomena, one of which is at least not seriously involved in the former group of materials.

Data of the first class are, of course, limited in distribution. The normal adult alone can thus coöperate with the experimenter, and put into his possession, at a stroke, the materials of which he is in search. Upon such observations, all ordinary work of the laboratory proceeds. It gives the rational basis for psychological theory, and affords the points of reference for a classification of mental phenomena. Abnormal individuals and variant types, for example, are measurable only in terms of the direction and magnitude of their divergence from the system of norms thus established. Pathological states and functions of mind are conceived as distortions of the normal. Defective individuals, as their name indicates, are imperfect embodiments of the type-character. The child, mentally as well as physically, is the adult in genesis, immature but essentially the same. The mind of the lower animal is a system of functions qualitatively given in human consciousness, but more restricted in its composition and elementary in its organization. Through every such series of characterizations runs the reference to a central type as the fixed point about which the whole series of formal or developmental variations swings. This common type is the normal consciousness of the human adult, whose features the psychological laboratory is engaged in systematically developing.

To coöperation in controlled reaction and introspection on the part of trained observers, the psychologist thus turns for guiding conceptions and classic problems alike. Nevertheless, the reports of intelligent and critical observers are but part of the primary expressions of mind upon which mental science draws. They afford knowledge of but a single type of mind, and that only in the later phases of its development. Though the point of reference for all constructive inference, it is necessarily incapable of revealing the range of pathological variation, the stages of development in the normal individual, the genesis of racial characteristics, or the series of types which the organic world at large presents. For the formulation of these conceptions, we must turn to the second class of materials, the unreflective expressions of mind.

In its most general aspect, however, the psychological significance of this system of expressions is not to be considered primarily in connection with its value as an adjunct to the interpretation of disturbed conditions of consciousness, or as the methodical ground of inference in mental pathology. It constitutes the general material of self-expression in its unmodified flow. Its presence is continuous and universal. Each technically deliberate expression of mind is but a local modification occurring on the surface of a free stream of unreflective reactions which constitutes its supporting medium.

At any instant, the preponderant mass of reactions, in which an individual mind is expressed, continues essentially naïve and uncontrolled. This system of data must, therefore, be of persistent interest to the psychologist. It reflects in the most intimate way both the mind's permanent disposition and its attitude at the moment. It represents the enduring effects of innumerable reactions, the modifications necessitated by conditions of exercise, the habits which the mind has achieved or unconsciously adopted. It is a manifestation—freed from the disturbance of critical attention and the paralyzing effect of a technical and self-conscious aim—of that general product of the reaction of original mental constitution to a special system of environing forces, which we call the actual present mind of an individual.

It is obvious that a study of such unintended expressions cannot be substituted for the directive programmes of specialized research. While it has tendency as well as character, the flow of experience lacks that concentrated movement which is implied in all investigation. At the same time, it enters into every deliberate observation and reaction, both as a disturbing element and as an illuminative context. It affords a unique setting which must be studied in connection with each individual report; for even the most highly trained and devoted subject can never so limit his attention and control his energies as to become, even for a moment, a psychological observer and nothing more. Thus, in the most specialized reactions, this active complex of forces must already be taken into account; while, in the general development of knowledge, it affords both the occasions to which problems owe their formulation and the material basis for our working-conceptions of mental constitution and life.

In their relation to the normal adult consciousness, the pathological and genetic extensions of the field conform to the distribution of type and variant at large. The series is not broken up into separate areas which are out of contact. Type passes insensibly into type, the fringes of the groups overlapping. In the study of mental pathology, though a methodical reliance upon intelligent coöperation on the part of the subject in obtaining the necessary data is excluded, yet, in many of its phases, the reactions and observations of the abnormal mind are taken by the psychologist at their full value, just as in the case of the normal subject.

Within the field of the pathologist, for example, fall many abnormalities in the mental content, as well as disturbances in the reactions made upon the materials thus presented. In such cases, the subject may be able to give a completely rational account of his experience; since the phenomenon, in so far as concerns the form of synthesis, is of purely objective origin. One may describe an hallucination as intelligibly as a new odor, or an incoördination of movement due to nervous lesion as fully as the motion of a bird in the air. Not until the general criteria of rational judgment are themselves disturbed does one touch the province of pathology proper. Indirect observation becomes the sole general method of study when the reaction upon the situation is essentially distorted, but not when its content is merely exceptional. When the psychological student is thus brought face to face with an observer who is himself abnormal, it becomes impossible to construe the datum immediately in terms of mental law. When content alone is involved, the case may be peculiar but the comment is rational. When, however, the interpretative activity is itself affected, direct observation is no longer possible whether the content be normal or abnormal.

A similar distinction runs through our classification of individuals in reference to problems of social adaptation and the question of practical or psychological sanity. Thus, so long as an hallucination is recognized as such, the individual is sane, though not normal; but when the hallucinatory content is accepted as valid, and the attitude of the self determined by this assumption, the basis of rational judgment becomes affected and the person is no longer considered sane.

The region in which indirect observation must be employed methodically is that of disturbed observation and unbalanced judgment at large. Not only the paranoias and delusions, the psychic instabilities and obsessions of hysteria, melancholia and mania, but every grade of agitation and disorganization intermediate between these extremes and the normal type, presents forms in which psychological coöperation between observer and subject is obstructed. Throughout this field of variations, the student must subject his data to systematic correction through indirect observation and tests. Under such conditions, the case is studied objectively, speech and gesture being supplemented by actions and habits, as a single significant complex offered for interpretation.

The second general field in which study must depend upon the unreflective expression of mental attitudes, is that of individual development in its early stages. In normal adult experience, the approach is direct and the product a result of the coöperation of many minds. But the child cannot thus be called to our assistance. Infant psychology, unlike that of the adult, is not developed by collaboration between subject and investigator in laboratory experimentation. The young child is unable to give a rational account of his own experience. He cannot be trusted to understand and answer questions intelligently. A sustained psychological interest in experience arises late in individual life, and the child finds it difficult to comprehend its aim. Even when he has acquired speech, the case is not sensibly altered; for the further complication is introduced that, in acquiring a medium developed by the adult to represent his own point of view and concepts, the child may introduce variations of meaning unsuspected by the student. The qualities and differences which a child marks by his use of verbal forms may not correspond to the distinctions which they indicate to the adult; as the color terms which a daltonist employs do not represent, even when correctly applied, those visual sensations for which they stand in the experience of the normal person.

Apart from the qualitative development of consciousness in the child, there is to be considered the rise of that critical and objective regard which is essential to all psychological observation yet peculiarly difficult to maintain. The mere knowledge that a particular form of reaction is under consideration may disturb its function and vitiate the results of observation. It is not the effects of self-consciousness or agitation which are chiefly in question in such a case, but the subjective attitude aroused by a knowledge of the nature and conditions of the problem, together with the expectation which is being submitted to experimental test. The reorganization of selective attention and association, which such an attitude produces, may so distort the natural form of the reaction as to afford a wholly fictitious support for the hypothesis which has been formulated. So weighty is this factor of perversion that the elementary conditions of experimentation in many cases require that the subject shall be kept in ignorance of the theoretical points at issue and the bearing of his observations upon them.

In the study of mental phenomena as they appear in the earlier stages of individual development, this factor of error is exaggerated. The child has less ability than the adult to objectify the stimuli and reactions of his own mind in such a way as to observe them without seriously modifying their course. The ease with which so-called hallucinations have been induced among children is a case in point. The presence of this tendency also undermines the value of general questionnaires when put into their hands. Until the capacity for objective observation develops, the study of mental growth must proceed by a critical interpretation of the child's reactions, including speech, as a characteristic but unreflective accompaniment of mental attitudes.

This criticism obviously does not touch the value of speech as a datum in the study of childhood. Language is an incomparable instrument for the expression of meaning and attitude. Its possession by the child is thus an enormous addition to the psychologist's resources. But, so long as it continues to be used naïvely, the constructive reflection of the scientific observer affords the general means of approach to the problems at issue.

In the third class of cases—the class in which the succession of mental types in the organic world at large is studied—dependence upon the first group of data becomes wholly impracticable. Two disabling obstacles to coöperation exist. The first is the lack of any system of common signs by which experience may be communicated. Animals and men do not, in any serious meaning of the term, share a common life; while the brutes show evidence of only the rudiments of such an existence among themselves. Since language is the expression of meanings reflectively formulated and roots in the sense of a spiritual community, the absence of the latter implies the lack of such a medium of communication, upon which the general bulk of psychological observation rests.

The more serious aspect of this obstacle is not the absence of a specific system of verbal symbols. The lack of a common tongue does not arrest the action of those who are able to conceive and formulate a theoretical problem. They proceed at once to devise a system of signs as a basis of coöperation. Throughout its field, comparative psychology labors under the profounder disability which an absence of reflective consciousness itself imposes. The problem which interests the psychologist cannot be made to exist for his subject. He has no recourse, therefore, but to the indirect method of studying the system of bodily attitudes and changes in which the animal's reactions to stimuli are expressed. Behavior, in a word, provides the general data upon which the student of subhuman mental types must depend.

This class of materials, like the first, has its characteristic sources of error. The interpretation proceeds, of course, from the intuition of the observer. It is based on his own immediate experience of the connection between mental attitude and physical reaction, between intention and act, between thought and behavior. The specific correspondences which characterize this relation are in part congenital and in part acquired. To no inconsiderable degree, they are the product of convention, while none of those having an inherited basis is unmodifiable. The form of modification, also, though it represents in general a useful adaptation, is not necessarily connected with the permanent conditions of reaction; but may arise from the purely local or accidental environment, as in the tongue which an individual speaks.

The interpretation of behavior in terms of the immediate correlations between thought and reaction which experience presents, is inevitable; but the observer soon finds that it cannot successfully be applied in an uncritical fashion. Not only does misunderstanding arise through lack of uniformity in the meaning of symbols, but this individualizing habit runs through the whole system of expressions. An attitude of disapprobation is manifested by one person through violent denunciation, by another through silence and withdrawal. The word may be misunderstood, the gesture misconstrued, the act misjudged, with ludicrous or deplorable results. Variations of expression must be studied and individual differences represented in modifications of interpretation. In our intimate personal contacts, these distinctions are manifold and refined, though in our reaction to psychological groups they commonly extend only to general characteristics, as when we contrast the northern and southern races as restrained or free in their respective expressions, or oppose the naïveté of the child to the conventionalism of the adult.

Our sense of security in such interpretation is proportionate to the likeness which we postulate between ourselves and the object. It provides the most sufficient basis for adaptation in the case of members of our own family, profession, club, or circle of friends. The features it touches increase in generality as we depart from our own type. With a man, one can be at home, says the man; but it is impossible quite to understand a woman. The adult likewise feels uneasy in the presence of a child. He is unable either to predict its conduct or to interpret its actions with completeness. A similar insecurity marks any assumption of unaccustomed social relations. The employer finds it difficult to be natural in a gathering of his workmen; and the servant is not at ease in the presence of his master when their professional relations have been set aside.

The difficulty of such interpretation increases with the magnitude of the differences involved. With men of the same profession or social status, with members of our own club, or church, or party, common interests and modes of expression give a sense of fellowship and security. But, when such community ends and we are plunged into new modes of thought and expression, when unfamiliar attitudes toward life and novel principles of valuation confront us, a feeling of insecurity arises which may make all specific interpretation or reaction momentarily impossible.

In our relations with men of other races and color, of other creeds and habits of thought, this hesitation is perhaps never absent; and, when escaped, it is rather by ignoring the difficulties than transcending them. Not only have the accounts of travellers suffered in this way, but the work of ethnologists and psychologists themselves has been subject to the same vice. The student, in approaching a racial problem through its literature, must therefore study the general interpretative habits of his authorities and the preconceptions under which they work. The primitive mind, for example, has been subject to serious misconception through the influence upon ethnological investigation of concepts derived from civilized culture and properly applicable only within its field.

It is in the study of non-human types, however, that the grossest errors of misrepresentation are to be expected. The difficulties arising from the magnitude of the differences to be dealt with are increased by the serious breaks of continuity which are encountered, not only in passing from the human type to its nearest allies, but at many points in the evolutionary series. The problem is also complicated by the presence of great variations in structure as well as in function. Differences in reaction among organisms having general anatomical resemblances may be conceived as variations in adaptation resting upon a fundamental identity in experience and its significance. But when the plan of the nervous system and general form of body undergo such modifications as to affect radically the conditions of sense-perception and reaction, the system of assumptions upon which interpretation proceeds is shaken. Observation and explanation alike must be subjected to a rigid criticism if the psychologist is to avoid misinterpretations due to the use of conceptions derived from just those features in which our own nature differs from the organisms under consideration.

The treatment of animal psychology is necessarily subject to errors arising from anthropomorphism; for his point of view precludes the student from applying a mechanical conception to the phenomena of behavior. Interpretation must be determined by those common features of structure and function which connect his own life with the type he studies. In certain organic forms, structural identities and the analogies of behavior exhaust the available data of psychological study. All non-constructive types, in which the results of mental activity have been embodied in no permanent objective forms, fall within this category. Within the limits of human life, this is largely true of the pathological field, in which, though constructive activity is not absent, it is reduced to an elementary form and produces only the curiosities of invention.

Of the earlier stages of individual development, this lack of permanent objective products is also typical. The infant mind can be studied only through observation of its primary manifestations. One must watch the young child as it moves and plays, as it cries or expresses pleasure, as it manifests inherited modes of reaction or acquires new habits through imitation. In a word, one must examine its immediate reactions upon the world, for it makes nothing that lasts. If, therefore, the mind of the child is to be studied, it must be through the direct observation of its expressions as they take place; for, as its activities give rise to no permanent objective products, so also do its characteristics lack enduring representation through an unmodified memory in the later mind.

Autobiography, which owes its fascination to the writer's interpretative commentary upon experience rather than to any indispensable picturesqueness in the facts of life themselves, is at once unassailable and unreliable. Its historical accuracy may be disproved or verified; but chronology is the least part of any significant life-history. The conception of the world which it represents, its judgments and points of view—the quality of experience and its valuation, in a word—can scarcely be impugned; since there is commonly no appeal from the interpretative consciousness itself.

Nevertheless, there can be little doubt that such writing is, in a very important sense, fictional in character. It transforms the original experience by applying to it those criteria of worth and meaning which characterize later life alone. The readers of biography, as well as its writers, are adults; and, in telling the story of a life, these two motives combine to direct the appeal to those who have both a developed artistic sense and a philosophical interest in the dramatic evolution of the human self. If a wholly new significance be not thus imparted to the original events, they are at least arranged in new relations and given a different perspective; so that even the most faithful autobiography is an interpretation of child-life and not a record of its proper and unique features.

It is thus a most difficult task to estimate the value of biographical materials in the study of mental development. For the writing, after all, is a man's thought, not that of a child; and it reveals primarily the workings of a mature mind. If the psychologist is to utilize such data, he must subject them to a rigid scrutiny and apply every available means in the correction of the various classes of error to which they are exposed, instead of receiving them as he would the report of a trained observer concerning his own experience in the immediate present. While, therefore, the study of biographical literature, and especially of autobiography, must continue to be of great interest to the psychologist—for it both presents a fascinating field for just such interpretative and critical activities as he delights in, and affords him illuminating examples with which to illustrate his own knowledge of mental development—it is still necessary to recognize its insufficiency as a general basis for psychological inference. The development of the child must, in a word, be studied at first hand, by the direct observation of his reactions upon the environment and his modes of expressing himself.

All these aspects of mental life—pathological, genetic, and comparative—which have been passed in review, have a double significance for the psychologist. They afford material data for his general study, in addition to providing a great series of independent problems. The central aim of psychology, from which its various interests ramify, is the study of the normal adult. In this type, all processes of interpretation and comparison find their ultimate reference. It is the radix of psychological classification. In terms of the direction and amount of their variation from this standard, abnormal and primitive forms of consciousness are described. It is true that each of these fields has also a status of its own in the province of psychology; it is the subject-matter of a special division of study. The pathology of mind thus becomes an independent object, approached with that systematic aim which one brings to a study of the normal consciousness. The same is true of those more elementary forms of activity which children, savages, and lower animals present. Each of these classes offers the same general problems, and is describable in terms of specific types and laws of functioning.

But, while these fields of inquiry constitute the system of special psychological sciences, they may also be studied from another point of view, in which each type is treated in terms of its relation to the normal adult consciousness. The study of the latter is not dependent exclusively upon the observation of phenomena within its own limits. Every related variant is theoretically capable of throwing light upon the nature of the type from which it diverges. In his study of the normal human consciousness itself, the psychological student, therefore, extends inquiry to minds which are neither normal nor adult nor human.

The supplementary data which these allied fields afford, fall into two general groups. The first comprises the study of children, savages, and lower animals, in which consciousness is manifested under more elementary conditions. In certain of its aspects, this class includes also the mental life of imbeciles and idiots. The adult mind works under a complicated network of restrictions. Its stimulations are of a high order of complexity, for each is modified by the whole system of associates in which it exists. Even where it springs from some primitive and universal impulse, the energy of the stimulation is reinforced or reduced according to the circumstances which have conditioned its functioning in the individual life. The original features of the mental constitution, in consequence, are overlaid by the whole mass of accumulated habit. Subject to manifold inhibitions, affected by a multitude of cross-associations, and modified by the influence of social conventions, the complication of adult action often transcends the possibility of disentanglement.

Experimentation affords the systematic method by which the problem of complication is met. The mental situation is artificially simplified, the element under investigation being isolated and examined separately. The approach through experimental simplification, however, may be supplemented by a study of the child and all other more primitive types of mind. In these simpler forms of consciousness, the positive impulses of the mind work nakedly, or under elementary modifications. From the study of mental reactions in these types, derive conceptions which find application in the treatment of those complexes of determinants which enter so intricately into the processes of mental life at higher levels of development.

Of these supplementary systems, the data offered by a study of mental development in the individual are the most important. It is this group of phenomena which, in type and significance, is most closely related to that of adult consciousness. Without this supplementation, the description of the adult mind is essentially incomplete. If conceived as a static or final type, only the formal correlation of its activities can be given, without any explanation of the differences they present. Descriptive psychology ends with the formulation of a problem, the solution of which is to be sought through the study of development. The present constitution and habits of any mind are but the terminal phase of a continuous succession of modifications, under the pressure of specific conditions and stimuli, which has finally given rise to that individual disposition whose unique characteristics enable us to recognize and differentiate it from other minds.

An analytic study of mental constitution makes it possible to give a systematic description of the features of any individual or group, and thus to formulate a classificatory scheme of types. But it fails to provide the means even for an approach to those general problems of explanatory science which are involved in the existence of any specific group of variations in pattern or reaction-habits. Generically this solution is to be sought in the historical field. To explain any phenomenon is to reconstruct its genesis so that it may be seen gradually taking shape as this history is passed in review, until it has acquired the form and relations in which it now exists.

In the study of mind, the data for this genetic treatment are not limited to the phenomena of individual development; though the latter field provides its most important general group of materials. It is supplemented by a collateral study of arrested development in individual cases, and of the minds of savages with their primitive forms of culture. In these cases, however, the types observed do not themselves constitute stages in a continuous movement towards a higher level of development. They are terminal forms, the very existence of which implies differences from the normal or civilized subject in antecedent stages as well as final status. The materials they afford cannot, therefore, be used uncritically in supplementing the data of normal genesis. The savage and the moron are not really children. Neither the history nor the prospects of the normal child are involved in such a case. The indiscriminate passage from one field to the other, in search of concepts or illustrations, can lead, therefore, only to confusion and error.

The same holds true, in its own degree, concerning the relations of human adolescence to lower forms of life and their early development. The specific genesis and final status of each organic type represents a system of determinants which, from the beginning and not merely at its close, has differentiated its nature and history from that of the human child. At the same time, the postulation of a community of constitution, and of reaction to the same general system of forces and conditions of life—especially the assumption of actual genetic relationship as members in a unitary evolution of living forms--gives to all the more elementary types and processes of development a definite significance for the genetic study of human psychology. They show not merely elementary patterns having similar constituents or forms, but features and principles of organization identical with our own, while stripped of the complications which a longer evolution has introduced.

Further, even when members merely of collateral branches, they represent the earlier products of that very evolution to which our own nature owes its existence, a large part of which is the common heritage of all the higher species. Thus the materials which their study affords become significant in connection with all inquiry into the elements and origins of mental life. In every normal mind are to be found many obscure impulses, dispositions, and reactions which an introspective study approaches only under great difficulty. Many of these traits are characteristic of the initial stages of development alone; and their early subsidence leaves but a fugitive impression upon the later mind. Others are the uncertain survivals of reaction-systems which have lapsed in the course of evolution, and now appear only in a rudimentary and scarcely discernible form. In some cases, they present wholly exceptional conditions of atavistic reversion to feelings and impulses which no longer have any place in a normal constitution.

In his attack upon this whole group of problems, the psychologist turns for assistance to a comparative study of related living forms and their modes of behavior, in which one after another of these constituents appears in forms more elementary, direct, or violent than are found in human life. Such a study helps in the imaginative reconstruction of earlier phases in man's evolutionary history, which have failed to leave even a trace of themselves in his present constitution, while they may still have persistently affected its character.

The second general system of supplementary data is represented in the psychologist's study of mind in its pathological aspects and under conditions of physical disease: its reactions under the influence of drugs or stimulants, and in fever-delirium or nervous exhaustion; the phenomena of hysteria, hypnotism, somnambulism, and mental disaggregation; and the forms of manic-depressive and delusional insanity, paresis, and the like. It includes also the study of vagrants and dependents, of the criminal and degenerate classes, and of that extensive borderland which on every side connects the normal mind with the extremes of aberration.

In all these cases, consciousness works under abnormal conditions. Here, it is the exaggeration of ordinary inclination into an uncontrollable maniacal impulse; or the breaking down of normal restraints and inhibitions, so that the stimuli of moderate energy produce excessive reactions. There, it is the suppression of a motive which has determining value for the normal mind; or the rise of inhibitions which render ineffective the customary stimuli to reaction. Whether from excess or defect in particular factors, there is thus brought about a disturbance of the normal relations under which consciousness is manifested, resulting in a pathological modification of the mind's activity.

It is a psychological law that the distinctive features of any organization appear only through contrast. Its constitution must be compared point by point with types which present definite variations, if an adequate conception is to be formulated. In the psychological field, the basis of this discriminative analysis lies in the system of variations which fall within the limits of normal activity. Within that field, every mental function varies both in the energy with which it is manifested and the relations it sustains with other activities. In this internal dissociation is given the condition for a further theoretical analysis of consciousness.

It is to this general system of data that the study of pathology is supplementary. It affords no new methods of approach or unique system of facts. Its service lies solely in an extension of the range of dissociative variations to phenomena which lie beyond the limits of normal experience. Absence of motive and absence of restraint, uncontrollable exaltation of impulse and paralysis of activity through exaggerated inhibition, are alike foreign to the natural course of mental life; but, in the field of psychopathology, they are all presented in a multitude of special complications. The nature of normal control is thrown up in vivid relief by the phenomena of mental disequilibration, in obsessions and insistent impulses, in mental taboos and phobias, in *folie du doute* and psychical nystagmus, etc., which thus afford a significant addition to the psychologist's general equipment.

The relation which the representation of an act bears to its performance, in ordinary experience, is complicated by the presence of associated systems of ideas involving the synthesis of the act with a general purposive plan, and by the existence of the so-called volitional fiat. The resolution of this situation begins, within the field of normal experience, in such phenomena as ideomotor action and perceptional reflexes; but further light is thrown upon it through a consideration of pathological obsessions and compulsion psychoses.

With a similar result, the problems of normal association and memory may be illustrated by a study of the phenomena of amnesia and paramnesia, of hyper-acute and hallucinatory retention, of hysterical states and the dissociation of personal memories into a series of levels. The phenomena of sensory anaesthesia and hyperaesthesia in their more nearly normal manifestations, the conditions of attention and distraction, and finally the orderly interpretation of the world at large which normal life presents, find an exaggerated or disproportionated, but always illuminating, reflection in the pathological disturbances of consciousness.

The objective expression of an individual mind, it has been pointed out, comprises its total reaction upon the world. Only in a narrow and conventional sense is it to be found in verbally formulated thought, or in the practical embodiment of our ideal aims. Psychology is interested in the whole empirical constitution of the mind and its expression. Every reaction and product, whether it enters into the deliberate programmes of reflection and practice or appears as a mere by-product of activity, must be studied if the actual character of the mind is to be determined.

The system of permanent objective forms in which mental activity finds expression, may thus be said to have its original manifestation in the individual features of bodily constitution and habit. These factors afford a general basis for the practical discernment of character. Voice, speech, gesture, bearing, and movement are apprehended as a significant complex, which is interpreted in terms of subjective attitudes and characteristics. These modifications, which at each moment constitute an expression of the individual mind, leave traces which accumulate as they recur, until a permanent disposition is imparted to the body. In this way, one's habits of life and specific reaction-types come to be represented in constitutional features, which the observer construes with scarcely less facility and assurance than that which marks his interpretation of facial expression, or the emotional qualities of speech.

But this immediate psychophysical connection extends to a correlation more profound than these indications express, for we recognize an original association between specific mental and physical types. This belief has found expression in all proverbial literatures, and persists as a material element in our discriminative reactions. Though attention customarily centers upon certain features—such as the face or eye—in this interpretation, its principle is inclusive and pervades the whole fabric of the body. Historically, it has both afforded ground for a more or less pretentious character-reading and been erected into a systematic principle of psychological or metaphysical interpretation. Its actual development has indeed characteristically occurred in connection with the pursuit of practical or speculative interests, rather than those of empirical science. In the latter field, its associations have largely been with pseudo-scientific systems of psychology.

The chief difficulty which is encountered in establishing any specific correlation in this field, lies in the complexity of the whole mass of associates which is involved on either side, and the impracticability of securing any actual dissociation of their constituents. The organism embodies the total result of previous stimulation, each increment being superposed upon those which preceded, in a unitary product. The features of no impression are individually preserved by this infinite palimpsest, in which all past experience is funded and expressed.

On the other hand, the correlation from moment to moment of functional modifications with specific mental reactions has given to this objective material paramount psychological value as a systematic means of record and comparison. In so far as the immediate objective correlate is concerned, it is in terms of this physiological reverberation, in its involuntary components, that the psychologist conceives the expression of mental activity.

It is only in a peculiar sense, however, that the body is thus called a product of mind. In its more general application, the term describes a system of modifications to which it has given rise in the material world external to the body, modifications which not only survive the individual reaction itself, but may preserve for later ages a permanent record of races and cultures of which not even a tradition remains. This psychological significance runs through all plastic treatment of materials, and appears in every adaptive reaction in which a change has been introduced by the organism into its physical environment. This creative activity is manifested in formal as well as qualitative rearrangements. It embraces aesthetic as well as economic products. It extends to changes in the reactions and dispositions of other human wills quite as much as to the manipulation of physical substances. For its systematic development, it postulates not only an objective condition in accessible materials and their plastic limits, but also—and more importantly—a subjective condition in the existence of ideal programmes and the instruments necessary to their realization.

In general, then, this productivity is limited by mental constitution to the uppermost ranges of life. It attains the status of a characteristic and sustained expression only in human experience. Within the latter field itself, it presents great variations in the history of culture as well as in the phenomena of autogenesis. Its general product is a slow accumulation of materials which not only represents the coöperation in age-long experimentation of a multitude of inventors, but also implies historical continuity and highly developed means of expression among those who participate in any culture. Under the conditions of savagery, this system of data must be meagre; and, until constructive activities arise, it will be absent from the life of the child. In subhuman types, above all, its value will be affected by the lack of a system of cultural materials and of a tradition of utilization, by the weakness of social cohesion and frequent dispersions, by ignorance of tools and means of communication, and especially by the lack of general ideas and a self-conscious aim. It is this deficiency which necessitates so large a dependence upon the direct observation of reactions in the study of mental life in all its elementary manifestations.

Among lower animals this limitation applies only in part. The higher orders show certain elementary constructive activities, from which something may be learned concerning their character. In many species, a form of communal life exists, which is sometimes marked by definite and permanent organization. Either in connection with the conditions of an associated life, or independently of it, arises also a series of activities which result in forms of permanent objective modification. There is systematic storage of materials. Shelters are built and food is gathered. Permanent ways of communication are opened, and devices for the taking of prey are employed. The existence of these objective products offers a means of approach to the study of typical habits in the various species of animals, and is of much importance in determining our general conception of their mental type. Comparative psychology utilizes all such materials; and adds to behavior, as a basis of interpretation, that whole series of permanent products in which the racial and individual life of the animal is expressed.

The products of constructive activity are of two general types, physical and mental. The former, man shares with lower animals; the latter is peculiar to himself. The former is the more elementary, and embodies primarily the means to practical reactions upon the external world and their products. The latter is essentially a later and more complex product, which represents man's theoretical and ideal interests in the world. In the transformation of physical materials, as already pointed out, the lower animals also share. Building nests, making lairs, laying traps, erecting dams, storing up food-supplies, constructing pathways to water, and establishing migration-routes—all these, which are instances of the first group of activities, make their earliest appearance in subhuman types. They represent the system of practical ends which the life of each species includes, and the use of means by which they are realized.

A multitude of human inventions belongs to the same general class, in consisting of definite rearrangements of physical materials and forces in the service of human purposes. In part, these material reconstructions represent the elementary needs which man shares with the brute; but in part, also, they represent ends which are specific and unique. To some degree, they are such as lower species have likewise shown themselves capable of developing. Nevertheless they chiefly belong to a range of conceptions of which there is no evidence in the brute, since their rise depends upon the possession of theoretical reason.

The system of mental products is likewise objectified in material forms. The significance of the product, however, does not now lie in the objective rearrangement as such, but in the idea it expresses. It is not itself the reality, but a sign of the reality. The ideal activity in the one case is merely instrumental to the material organization which results; in the other, the objective rearrangement is instrumental to the existence of an ideal system which it stimulates the mind to organize. The significant reality in the case of a book, for example, is the system of ideas which its pages are capable of arousing in the mind. Of this, the material assemblage of printed sheets is but the sign. A piece of music, a painting, a statue, and to a less degree a building, are of significance for what they express, and not primarily for any use that can be made of the material object through which this significance is conveyed.

The product of any form of fine art, for example, is the expression of beauty. In the closeness of its conformity to this ideal, and the directness with which it attains it, is to be sought its meaning or value for the consciousness to which it is presented. As a material existence, every such object has also definite quantifiable relations in the physical world, and its substances may serve many practical uses. But no descriptive mode of treating the object of beauty, or any demonstration of its utilities, will bring into view its proper aesthetic value. Still more evident is this instrumental significance in the case of all materials of communication. Each physical arrangement and form of change is a sign to be interpreted. The relations with which the mind deals in the consideration of all such data, must be conceived as a system of ideal values and ends which the object symbolizes or conditions.

It is through this class of products that the qualities and forms of human action are characteristically revealed. The spirit of a time is embodied in the perennial brass of its monuments. War and adventure, exploration and discovery, science and invention, the love of gold and power, the desire for knowledge, the will to mould the earth's forces to human use—all these aims and aspirations may be traced in the material transformations man has wrought, and in the ideal organizations he has brought into existence in practical and theoretical realms alike, as conclusively—if not as unambiguously—as when his reaction under systematic tests is observed.

The story of the human mind is most fully and impressively written in the history of humanity. Of that story, there is much that cannot be traced by any observation of the individual and his reactions. In the study not only of its larger social features and slow historic change, but also of the development and application of conceptions which are formulated only in confronting serious problems, whether theoretical or practical, the psychologist supplements his direct study of mental functions by an exploration of these manifold products of human activity.

# CHAPTER XII

# THE PROBLEMS OF PSYCHOLOGY

PSYCHOLOGY, like every other branch of empirical knowledge, is concerned with the observation, description, and explanation of fact. It differs from other sciences only in the qualitative nature of its data and in the specific conditions under which their common conceptions of aim and treatment are realized. In its application to the study of mind, however, scientific procedure is complicated by the fact that our conscious life embraces a system of values as well as a class of facts. The content of experience may be regarded as an historically conditioned field each element of which has a discriminable quality and occurs in a determinate order. But it is also a significant experience in the life of a self whose very being consists in the exercise of preferential reaction grounded in a sense of worth.

These two systems have not the same status. Experience, in its immediacy, is a world of meanings and attitudes, of values and their organization, of plastic materials and ideal aims. Change and succession are living moments in the history of a self before they become events in a causal sequence. Meaning is conceived first in its teleological, and only later in its historical, relations. In our synthesis of experience, the notions of function and adaptation precede those of origin and genesis.

Attitudes of will are not only the logical correlatives of action, but also afford the primitive mechanism for our representative thought. In the imagination of child and savage alike, the world is animate and ensouled. Everything lives and strives, suffers or triumphs, because everything is the embodiment of individual will. Primitive man conceives the world in his own image as the result of an immediate and inevitable self-projection which attributes character and tendency, wilful aim and significant action, to everything in nature.

Even in our mature reflection, this viewpoint is maintained. We postulate in the universe a rationality and moral consistency which we fail to find within the limits of experience, explaining its irrationalities or injustices by the limitation of our view. Human experience, we say, is but a fragment of universal reality; the disturbance of values we find within it, an illusion of spiritual perspective. In imagination, we leap the chasm of death and, upon the screen of a greater, or immortal existence, project the true vision of our world in which the meanings of life are completed, its theatre of action universalized, and a realization of the ideal postulates of existence made possible through an application of the principle of recompense.

Whatever the specific direction it takes or the philosophical formulation it may receive, every conscious life is the progressive manifestation of such a system of ideal forces. What it seeks or appropriates is dependent upon its own constitution and tendencies. According to the character of individual needs and desires, the materials sought and the uses made of them will vary. That self-activity is conditioned by an objective material, and that it may be aroused, stimulated, or even directed by another person, are irrelevant. Value is necessarily original and inherent in the subject of experience. It has neither origin nor explanation in a world beyond the self. This immediate value which we find in all experience, is the fundamental aspect of reality for each of us. Selfhood is expressed in a significant system of judgments or appreciations, and of reactions or appropriative choices.

The constitution of the self is, of course, not simple. It possesses manifold sensibilities and capacities. Its activities have, therefore, diverse directions, and many principles are embodied in its reactions. Now one criterion of valuation is dominant, then another; and, at successive moments, individual preferences may run counter to one another. The integrity of any self may vary from a well-knit organization manifested in coherent principles of selection, to a loose succession of individual appetencies. But whether the unity be great and dominating, as in a fully developed self, or weak and fluctuating, as in that of the child and certain abnormally volatile types, the centrality of value and preferential reaction remains unaffected.

On the other hand, this aspect of our life has, of course, no independent existence. Experience is never reduced to pure values. Worth has characteristically an objective basis, as the quality of experience, similarly, carries with it habitually the reference to a cause or ground in fact. A dislike is a dislike of something. Enjoyment connotes a subjective state, but implies also an objective correlate. So inveterate is this habit that, when modifications of consciousness are aroused by obscure changes in physiological condition, we project them against a material or social background, by a sort of intellectual mirage, and construe them in terms of some fictitious cause.

This distinction between its "appreciative" and "descriptive" aspects is forced upon us by the very nature of experience. Reality is neither pure quality nor pure subjectivity. We do not experience—though we may formulate the condition as a theoretical limit—states which consist in moods of feeling and nothing else. Value is habitually grounded in a specific describable content. In individual experience, the quantitative relations of these two constituents may so vary that now it is the awareness of fact which predominates and then the appreciation of value. But, in every appreciative reaction, there persists some consciousness of the nature and relations of the fact involved, no matter how serious or intense the feeling of significance. And every observation of fact occurs in a moment of experience which has also its felt appreciative aspect, as a response to the total situation if not as a judgment of the fact involved. In other words, individual consciousness is at no moment reduced to a pure act of objective regard or to a pure feeling of appreciation. These, as pointed out in an earlier chapter, are the abstract elements of experience, the logical poles of existence in any object of consciousness.

In considering the problems of psychology, it therefore becomes important at the outset to note the results of applying these two systematic conceptions to the mind, in order that we may see in what ways the psychologist is brought into contact with each of them in working out his programme.

The first of these systems represents the reaction of the self of intuition, with its practical or moral aims and its intrinsic values. If an individual mind as a whole, or any part of its activity, be considered from this standpoint, it appears as something which has significance in a larger whole. Whether it be interpreted in terms of that larger system, or be construed as an indispensable factor in making it possible, is indifferent.

These are but opposite modes of expressing the same fact. The part may be said either to contribute toward the significance of the whole into which it enters or to receive significance through its association therein.

The individual life has thus a status in the ideal system of values which society represents. It is a positive contribution toward the realization of social aims, or it is an obstacle to their attainment. The individual reaction, similarly, has significance in that dynamic system of values which a personal life or—taken statically—a self represents. It either supports the movement toward some ideal end or interferes with its realization. Each constituent of any given moment of experience may be regarded in the same way; for it must be either harmonious with the dominant mood of that moment or opposed to it.

This point of view obviously affords the basis for a systematic treatment of the mental life. It shows us the mind at work, moving toward specific aims and exercising its powers in the utilization of materials. This presupposes a unity of constitution which gives to all its parts organic relationship in a common life. It must have meaning and value, purpose and direction, coherence and individuality. Otherwise there is nothing to be preserved, sustained, or furthered.

This functional view of the mind—and of the world at large—will always continue to engross attention. It is a study which antedates all psychology and all science; for, in its widest meaning, it is the study of reality—of the objective world and our own constitution—in its values as material and condition of self-realization. Out of this attitude there thus springs a sustained interest in knowledge as well as achievement on the part of the individual. Neither his own nature nor that of the world, as condition of success, is known in advance. The direction of conduct, in so far as it is grounded merely in impulse, is blind. What is desired may be rendered unattainable through defect of constitution as well as through lack of opportunity. The imagination may represent ideals made inaccessible by psychophysical limitations. These limits and potentialities must be empirically determined. Though conceived as positive momenta, defining the trend of individual genius and the energy of its forces, they require the presence of qualitative stimuli and materials for their actualization.

Similarly the specific content of this whole objective system must be empirically determined as a condition of its utilization in furthering the aims of life. Success depends upon alertness in noting the characteristics of things, and quickness in applying in practice the conceptions thus derived. As a result, there grows up in the individual life a body of knowledge and a tradition of usage which are imparted to other individuals through social contact and handed down from generation to generation as a growing system of cultural values, materials, and criteria.

Into this objective, yet ideal, universe each individual is born; and, throughout his life, it continues to afford direction and support to his activities. This material of culture, which has been created by preceding generations of men, appears to the new individual as a magnified and elaborated projection of himself. It possesses a certain miraculous fitness for his needs, a familiarity of quality upon initial contact as if the self were recalling some remote and forgotten experience of its own instead of meeting novel situations and acquiring new reactions. In a profound sense, this is true. The system of culture of any people is the objective form in which the racial soul has found expression; and, of that soul, each particular self is born. There is, of course, a uniqueness of constitution, in any human individual, which marks it off from all others; and this distinctive cast retains its features throughout life. But there is also a principle of enduring resemblance which pervades all the members of any common generation and unites the successive protoplasmic waves of any racial stock.

The community of nature which thus binds an individual to his type, is much greater than the system of specific variations which marks him off from it. It is expressed immediately in his inherited predispositions, as well as mediately in the cultural materials which social tradition has conserved. Between these systems, there is a natural and essential congruity. The individual self finds the social form of existence into which it is born, adapted to it in advance. What, in general, it needs, the environment offers; and what social authority requires, it is predisposed to grant. In language, custom, tradition, law, faith, and the plastic arts, the self finds a congruous means of expression as well as the general condition of its own development.

In the living experiment of existence itself, the individual thus discovers the idiosyncrasies of his own nature and the constitution of the world around him. This knowledge, which accumulates as life proceeds, is, for the most part, a practical and unreflective acquaintance with what is desirable. It is largely unformulated; and, though it is decisive in the reactions of life, its subject may be unable to give any coherent account of its nature. It is a dumb conviction as to what is right, or preferable, which is characteristically expressed only in the practical decision itself.

But man has a reflective interest in his own nature and the circumstances of life as well as a practical concern in their development. In its most casual form, this interest appears as a desultory reflection upon the nature of the self or the meaning of existence when, at some leisure moment or in consequence of a climactic movement in experience, there has been aroused a transient introspective regard. In philosophic history, this interest becomes a sustained principle of treatment; and we are made to understand racial or individual genius as an ideal system of forces seeking self-expression under the conditions imposed by its own constitution and the opportunities or obstacles of fate.

In pure literature, this principle appears under a certain transformation. One is no longer interested in any concrete existence in its wholeness, with every idiosyncrasy of constitution and all the irrationalities of circumstance developed as actual life presents them. Instead of continuing biographical, the point of view has become aesthetic. One is interested in the spectacle of this ideal development and conflict, so simplified in its materials as to be comprehensible and so unified in its action as to present a coherent development in its incidents and attitudes of will.

Pure literature represents our original interest in the immediate values and reactions of life. It is thus concerned with historical fact only in the sense that its characters and situations must conform to the conditions of actual existence, since serious fiction or drama—unlike romance and extravaganza—make their appeal to the sense of truth. When, therefore, it undertakes the analysis of individual character, or unravels the threads of a complex situation, or traces the historical development of a dramatic action, it is the significance of experience and not its existence as fact which determines the view-point. Such reconstructions, with the appreciative judgments which accompany them, may afford original materials of suggestive value to the psychologist; but they contribute nothing to the solution—or even to the formulation—of his problems.

With criticism, the case is not so clear. Criticism seeks to bring to full reflective consciousness the data and processes involved in our appreciative judgments. Its function is not that of mere retrospect and affirmation. It is a disciplinary activity which sharpens the mind's reaction and enriches the material basis of its judgments. In this introspection, criticism aims not only at a penetrative analysis of the mind's positive reactions but also at a comprehensive study of the empirical materials upon which they are grounded with a view to the discovery and formulation of the ideal postulates which these preferential reactions involve.

This whole body of reflection might, of course, in a general sense, be called psychological. Not only the literary or the artistic critic but also the novelist and even the painter and the musician have been called psychologists. The limit of extension in this direction appears in the use of the term to describe one whose social responses are quick and successful. This sympathetic rapport, with the facilitated adaptations to which it leads, we need not consider; but the critical activity has obviously much more in common with psychological science, since it undertakes a reflective analysis of the mind from a systematic standpoint.

If the term be thus extended, it is important to observe just what the word "psychological" means when used in this way. Criticism is concerned with the worth of experience and not with its existence as fact. It is an appraisal of values which is always in question.

Criticism aims to bring the logical grounds of valuation under systematic review and, by this means, both to give them coherence and to make them function more completely in our judgments. It also undertakes an examination of the material data and conditions of reaction, in the object of value and in the constitution of the subject himself, in order that the judgment shall have the fullest possible grounding in fact and be formed in conscious dependence upon its premises.

But, in all this review, criticism is not concerned with those aims which occupy science, except in so far as—being an interpretative comment upon life—it is interested in knowing that the facts and situations with which it deals are actually representative of that experience which it professes to treat. This latter procedure, however, lies quite outside the province of criticism itself, in which the existence of its material datum must be taken for granted. If I ask what significance a certain passage of music has for the composition in which it occurs, I raise a problem of criticism. But, if I inquire whether the passage in question be part of the original production or form a later interpolation, my question does not touch the critical problem at all; it is a matter of historical fact. All such problems must be worked out beforehand. Their determination is presupposed in criticism, not in the sense that the verification of fact must be completed before criticism can arise, but in the necessity of a datum if criticism in any form is to be exercised.

On the other hand, since criticism is an interpretation of the empirical content of experience, every change in the datum will affect the conclusions which are drawn. Thus the reinspection of fact and the historical development of knowledge are important factors in the history of criticism. As our acquaintance with the empirical content of any people's culture extends, we reconstruct our interpretation of their art, their religion, their social conventions, their practical aims and conceptions.

Criticism, while dependent for its data upon the determination of fact, has thus nothing in common with psychology in either aim or method. It is a part of philosophy—that reflective evaluation which we apply to all the materials of experience—and not of science, which is concerned specifically with developing what may be called the general data of philosophy, in the discovery of fact and law whether concerned with things and their relations, with historical change, or with the mind's constitution and reaction.

In its application to mental activity, a further ambiguity in the use of the word "function" should be pointed out. The term may be used to denote the conception of mind as an organically related system of activities each of which makes a unique contribution to the general economy. Each such constituent has also its origin and historical conditions. It is with these that psychology is most largely concerned. But the causal relation may be read in either direction—retrospectively in tracing backward the series of antecedents, or prospectively in observing the succession of consequences which flow from it. To analyze a mental activity or reaction in this way, and to trace the effects of introducing a new factor into its constitution, are obviously part of the general undertaking of mental science. If the term "functional psychology" be used to describe this point of view, it simply marks the distinction between descriptive and historical methods, or rather, between the conception of a fixed system of things such as can only be described or classified, and the conception of change—

of condition and consequence—of process as opposed to product. The distinction is analogous to that between anatomy and physiology, for the latter describes the characteristic activity of an organ, or of the organism as a whole, without affecting in any way the status or importance of structural analysis. Indeed, the two points of view are obviously of complementary value. In this way, one may describe either the structure of the eye or the process of vision; one may explain the nature and distribution of the capillaries or the mode in which the blood-corpuscles are forced along their courses and the relation of capillary activity to the general circulation of the blood.

Similarly one may introspectively dissociate the general mental content into its chief classes of materials, or trace through its series of stages the mental reaction to any new qualitative element which may be introduced. One may regard a mental complex (such as a percept) statically and make a logical analysis of its constitution; but one may also study its genesis and historical conditions or its dynamic value in modifying the flow of consciousness. One may observe the qualitative dependence of thought-processes upon an imaginal content, the necessity of reproductive to creative imagination, the relation of sagacity and learning as factors of reasoning, and so on. But one may also follow the mental process concretely, and study its kaleidoscopic changes as one constellation replaces another in a succession which everywhere exhibits the modifying effects of the present phase upon that which follows and the influence of past experience, knowledge, and habit upon the whole impinging system of impressions. It is part of the work of psychology as an explanatory science to trace all these connections, whether on the basis of a general reflection upon the data which experience affords or through the use of specific experimental tests. A functional psychology of this kind presents no problem, because it does not adopt a teleological point of view or depend upon the concept of a purposive life with its system of values.

But another meaning may be given to the term, erecting it into an independent viewpoint which cannot be included in the same category with natural science. A functional psychology, in this sense, necessitates a systematic treatment of the mental life under a new regulative conception. From the latter standpoint the mind is regarded as a system of significant attitudes and aims, in terms of which each experience and reaction is to be interpreted. Now while every act has a meaning as well as a cause, and can be treated in terms of its teleological significance as well as of its historical origin and development, it is mere confusion of thought to substitute one for the other in the course of a continuous account of the mind. If psychology is to conform to the canons of natural science, it must consistently seek to discard the methods of a purposive psychology and confine itself to an account of the antecedents and genesis of mental phenomena. The introduction of conceptions of value can issue only in an indication of the practical relations of mental reactions or a metaphysical reflection upon their existence.

In its own special work, psychology confronts a great congeries of problems susceptible of many groupings according to the way in which they are viewed. Not only have its materials manifold aspects and relations, but the whole system of data must be surveyed in connection with each point of view which is applied. This simplifies the task of stating the general problems of psychology; for we shall be concerned not with the indefinite multitude of specific researches which may arise, but only with the attempt to express its essential aims in terms of a series of conceptions which must be regarded whatever the activities or types or stages of mental development under discussion.

Certain complications are thus immediately excluded. We shall not be occupied with problems which may arise from an extension of the field to new mental types, or from the appearance of new qualitative complexity through advance in the process of dissociative analysis. In a word, the ways in which an enrichment of its data may react upon psychological classification or theory are not to be considered. The study of mental pathology has already added an extraordinary variety to this material content, and shown us most diverse modes of reaction and valuation. A similar empirical enrichment has resulted from the study of mental development in its earlier stages, as manifested in childhood, primitive culture, and lower types of life. But this enlargement of the mass of data has not, as such, given rise to any new general problems, though it has both increased the material complexity of psychological investigation and modified many of the working conceptions of the science.

Similarly all considerations rooting in conceptions of methodology are to be excluded, though differences in approach affect both the qualitative data reviewed and the specific problems which are formulated. The addition of observations concerning behavior-modes to the data of introspection, for example, introduces no material modification into the general problems of psychological science. They are merely supplementary methods of establishing those facts from which inquiry starts, the specific material content of mind.

Similarly the terms "theoretical" and "experimental" do not serve to define two groups of psychological problems, though each has, of course, its own technical ends to formulate and attain. In that systematization of phenomena at which science aims, theorizing is the formulation of conceptions of relationship, while experimentation is the determination of their validity by application to a specific set of selected facts. Whatever the particular subject-matter with which we are concerned, it will necessarily have a theoretical aspect, since our aim is to formulate its constitution and relations in a system of concepts; and it will also have an experimental aspect, since that exact determination of its features upon which theory proceeds can be attained only under the conditions of experimentation.

The same holds true if we turn from an inspection of the mental states or activities themselves to a comparative study of types, or an examination of their historical genesis. Supplementation of this kind affords either a clearer preception of what the complex of phenomena actually is or a truer apprehension of the relations in which it stands; that is, it is either a means to the establishment of fact or a contribution to the formulation of theory.

The immediate data of consciousness as revealed through introspection, constitute the primary field of psychological study. In the consideration of problems as of methods, our logical starting-point is this immediate experience of the introspective self regarded as a qualitative datum. Within any such field, the first concern of science is the observation of individual fact, the specific differentiation of its material content. The actual range and variety of its phenomena must be brought to light as a necessary condition of any systematic treatment.

In many sciences, the necessity of thus exploring and charting the field is as obvious as it is serious; for the facts with which they deal are either remote or obscure. It requires not only technical training and the elaboration of methodical devices but also inventiveness on the part of the individual student to bring them to light. In large measure, the facts described in histology or chemistry, for example, or in paleontology, and archaeology, would have remained forever hidden had our contact with them depended upon observations connected with the activities of daily life. They have been literally unearthed by assiduous labor on the part of specialists, and exist only for a small group of scholars.

In certain other cases, the science deals with a class of facts which are assumed to be the common possession of mankind. This attitude marks our relation to the social sciences as contrasted with the physical. The data of psychology, of ethics, or of aesthetics, are, in a certain sense, familiar to us all; and the layman in these fields asserts his judgment with an authority which he would never venture to assume in zoology or organic chemistry. Nevertheless, as already pointed out, the observations incidental to daily experience cannot in any strict sense be said to afford the data of psychology. Its point of view is not identical with that of practical common-sense; for that aspect of any experience which is central for psychology, common-sense largely ignores.

Communities of thought, feeling, and action, with their purely practical variations in the individual, are what concern us socially and morally. Our minds are a glass through which the objective world is viewed while it remains itself invisible under normal conditions. But it is just this medium which psychology studies. It seeks to bring into clear light those qualitative modifications which are overlooked because they do not appear as determinants of social reaction, as well as those which function positively in our response to stimuli.

In simple literalness, the individual does not know his own mind in the scientific sense until a systematic study of it has been made under experimental conditions. Even in a practical sense, this may be true; but psychologically it is as clear as that no one has a systematic knowledge of botany, for example, merely because he has kept a market-garden. Modes of thought and modes of behavior alike escape notice in our naïve experience. Images, ideas, memories, and anticipations that appear for a moment only to be crowded out by the pressure of more engrossing demands, impulses, and cravings; fleeting moods and casual affective reactions to stimuli which the current of experience casts up only to be sucked down again by the stream: the items thus overlooked or immediately forgotten are uncountable even within the limits of normal waking life.

If we add to this the more obscure and unusual aspects of experience, when either the stimuli or the conditions of reaction are disturbed, a new series of phenomena will appear which are the less clearly and fully noted because their exceptional character has affected the observer's point of view and given to their sensational features a quite disproportionate value in recollection. In some cases, the failure of memory may shut off from later revival the total content of a certain time, as in the case of traumatic shock and—partially at least—in that of sleep. Again, the conditions may be such as to disturb or conceal the relations of any such group to the mental life at large, as in the relation of dreams to wish-fulfilment. In still other cases, the disturbance of general condition is such as to interfere with all impartial observations, as in violent emotion, in fever delirium, and the like.

It is true, on the other hand, that psychological science at large has had its beginnings in the mass of observations which has accumulated, as part of the common tradition of mankind, concerning the nature, development, and relations of mind. Part of such observation is of a purely practical nature. Much of it roots in a metaphysical interest and is properly an interpretation of the significance of mind rather than an observation of its features. Some of it is a true, though elementary, psychology, reflecting an interest in the character of mental reactions themselves.

Such popular knowledge gives but fragmentary and discontinuous glimpses of its object, but it affords a general starting-point for systematic inquiry. Mental science begins by substituting for this desultory and practical viewpoint a direct and sustained interest in the nature of mental phenomena themselves. While the mass of observations concerning the human mind which has accumulated in folk-lore is perhaps greater than in any other field of natural science, the establishment of psychology does not mean a mere extension of its boundaries. Much must be revised and even rejected because of its actual misrepresentation of fact. The first task of psychology—its preliminary undertaking—is an exploration afresh of the whole field in order to secure a full and exact knowledge of the nature of individual experience.

This knowledge—of endless, detailed, specific fact clearly observed and accurately described—is the first demand of science, its cry for elementary nourishment. It is not always heard with equal insistence. Historical rhythms have sometimes been sharply accentuated, the pendulum swinging back and forth between empirical discovery and theoretical systematization. Every geographical enlargement has enriched the material content of science; and a stimulus to renewed observation has again and again arisen from advances in the mechanics of experimentation.

But the problem is essential rather than accessary. It will continue to be a permanently important aspect of science at all stages of its progress. Perhaps the quantitatively greater part of investigation at large is represented in empirical observation. In a sense, it constitutes the very method of experimentation, since the test of theory consists in an observation of facts not hitherto determined. Psychology has not merely added a great body of observations to our popular knowledge of the mind; it has laid the substantial basis of all such knowledge in what it has thus experimentally established. For popular tradition contained nothing which could be directly utilized, nothing which did not need to be put on a new basis and made specific, exact, and comparable.

All this procedure is, it has been said, preliminary. Science is concerned with an understanding of fact, not with a mere elementary acquaintance with it, however varied. It presupposes such an acquaintance as a condition of the initiation of its own peculiar work, which consists in a determination of the relations in which these facts stand, whether the logical relations of likeness and difference, the dynamic relations of condition and reaction, or the historical relations of origin and development. Botany, for example, makes us acquainted systematically with the plant world in all its overwhelming richness, by defining the features and distribution of its great fundamental groups with the host of individual types which each includes, and indicating the specific features of form and habit by which they may be discriminated. In a similar way, the fragmentary knowledge of mind which the circumstances of life afford to each one of us, is replaced by the systematic view of psychology which gives a general setting and unit of measurement, affording a perspective in which it may be seen and a criterion by which it may be classified and given a rating. Psychology, of course, aims at much more than this; but to develop such a comprehensive and proportionate view of the field in all its material extent is its first and most general aim.

For this portrayal of the mind's typical features, it is, of course, not sufficient to observe mental facts as they are concretely presented in individual experience; for these are complexes of elements often of a high order. It is indeed upon these unanalysed complexes that traditional conceptions of mind are founded; but, in order that a systematic knowledge of their nature shall be made possible, it is necessary that these complexes be broken up into their elements. Such analysis is the condition of scientific treatment everywhere. The individual experience, and not merely the mind as a whole, is a complex which must be resolved into its elementary constituents if either its own composition or its relation to other mental phenomena is to be understood. This resolution includes the qualitative analysis of its material content as well as the determination of its most general forms of reaction. Individual experiences are no more simple and unique than individual things. They are mental composites in which we can dissociate a variety of qualitative components and identify certain common elements.

Whether the ultimate product in any such case be a single constituent, as in psychological sensationalism, a duality as in the recognition of sensation and affection, or a still greater plurality, is a matter of indifference so far as the dependence upon analysis is concerned. Similarly, the manifold of individual mental activities is reducible through the existence of general forms of reaction under which its variables may be classified. Remembering, comparing, conceiving, judging, generalizing, and so on, are both discriminable and assimilable. Each has features which distinguish it from the rest, but possesses, at the same time, characteristics which are common to the series as a whole, making it possible to apply to all these individual processes the word "thinking." Similarly longing, desire, aversion, regret, hope, and so on, differ from the group just described as its members did not differ among themselves; and, at the same time, these latter terms belong in a common category of their own. They possess a characteristic which has sometimes been called conation, sometimes volition.

Whether we gather a small group of activities together under such a term as conception or aversion, or attempt a more inclusive generalization as in intellection or appetency, is merely a question of the technical aims involved. To get order into the assemblage of qualities or reactions at all, we must find resemblances and differences which mark them off into natural groups; and the process by which this is achieved is the detection of common constituents or elements. It depends wholly upon the empirical nature of the materials whether this examination shall result in the discovery of a single unit or the acceptance of a plurality of irreducible components. The psychologist must trace these identities throughout the mind's constitution, dissecting its material complexes and its habitual reactions by means of introspective observation or experimental dissociation until the limit of possible resolution is reached and the widest basis of comparison established.

This method of analysis brings into view a multitude of idiosyncratic variations which sharpen the distinction between mind and mind, affording the general material for a differential psychology. But its more general significance lies in the discovery of those fundamental communities of structure and function, of qualitative make-up and form of reaction, which make it possible to view the activities of any individual mind as a coherent system.

This analytic study of mind is itself a preliminary undertaking; for the central concern of psychology, as of science at large, is with problems of dynamic and historical relationship. It studies the interaction of element with element, the modification of a given system resulting from the introduction of a new component, the specific correlation in which each quality or reaction appears, the principles according to which they are organized and the characteristic forms in which they are manifested in the activity and life of the mind. Of this process, the analysis of mental complexes is a condition. The constituent unit must be determined before the constitutive principle of any complex can be formulated.

These principles are, of course, indefinitely many; for, in its wholeness, the task of psychology is a determination of the total association-system in which any given class of materials or reaction-elements exists. The relation of sensation, for example, must be established not only to perception but also to imagination and memory and thought, to feeling and emotion, to desire and will.

The progressive determination of this endlessly complex system of specific relationships has both a qualitative and a quantitative aspect. The qualitative problem has largely been met by introspective methods without resort to experimental control and dissociation. The chief contribution of the English school of psychology has been in this field, in which it has shown an extraordinary acuteness and thoroughness. It is a work closely allied to the dissociation of qualitative elements; for a demonstration of the results of introspective analysis very naturally consists in showing how the mental elements thus discovered actually enter into combination and so give rise to the familiar states and reactions of the mind. Or, it is perhaps more correct to say introspective analysis, in English psychology, was the method of approaching the real problem of ascertaining and setting forth the forms of association which the mind presents, together with their constitutive principles.

The quantitative treatment of this problem begins with the rise of experimental psychology. It is not sufficient that a qualitative analysis shall be made, that the relation of anticipatory ideas to voluntary action, for example, or the function of affective tone in the stimuli which provoke it, shall be established. Science in all its branches seeks exactness of knowledge through the definition of units of measurement and the working out of a quantitative series of comparisons by their employment, a procedure which is of practical importance as well as of theoretical value.

Psychology, for example, passes at once from a recognition of the general dependence of retentiveness upon variations in the original impression to the inquiry as to how many repetitions of a given impression, such as a series of names or numbers, are necessary in order that it shall be reproduced completely at its close, or as to how much of such a series is reproduced when only a single impression has been received. It inquires concerning the comparative amounts of any sense-material which are identified when re-presented and when, in its absence, it is reproduced in memory. It does not merely note the phenomenon of simultaneous contrast in sense-qualities or intensities, but seeks to determine under representative conditions the amount of such modification introduced in each class of cases. It measures the distraction of attention to some elementary mental operation which is caused by the introduction of a specifically controlled stimulus, and formulates a scale of complications in an ascending series of mental reactions by comparing the times required for their completion.

In this first general group of problems, there thus fall some four or five subordinate undertakings. The world of mental phenomena must be explored and charted so that the actual extent and variety of its contents may be established as the material stimulus and basis of reference in all later inquiry. With this specific content, all analysis, description, and formulation of law are concerned. This whole range of material must next be subjected to a thorough qualitative analysis in order that the constitution of each complex may be determined and the most general, or fundamental, elements they present be isolated and defined. The products of this resolution afford the requisite basis for a comparison of the innumerable unique complexes of experience in terms of common and simple units.

Following upon this analysis, a qualitative study of mental states and activities must be undertaken in order that the specific make-up of each complex may be known both in its material constitution and in the form of organization it presents. The interaction of these complexes and their elements must be studied, as well as individual differences in constitution and their gradations, if any orderly account of the mind is to be given.

Finally, a double synthesis is to be sought as a result of these researches. On the one hand, there is to be organized the abstract system of laws of relationship which mental phenomena present, affording the general scheme in terms of which we conceive the empirical mind. On the other hand, there is to be worked out a concrete representation of the mind showing both its material composition and its typical reactions. This delineation begins with a description of its normal constitution and action, but includes also its variations and important forms of disturbance, whether these fall within or beyond the limits of the central mode.

This specific characterization is not, in general, the definition of a simple type. Even within the limits of introspective psychology, which draws its materials from the sane adult mind, the discrimination of a series of types is found indispensable—of sex and age for example—each with its specific system of variants. The pressure of this demand for differentiation both in the formulation of law and the characterization of type, increases as the scope of psychological study is extended to include a wider and wider range of organic species.

The general aim in this group of problems may perhaps be called description. It makes us acquainted in a systematic way with the specific features of a series of phenomena the unity of which we express in the words, "the individual mind." It shows us a group of types and variants, a general form, and an intimate structure, common elements which run through the field at large and unique groupings arising from their combinations, quantitative distribution of individual traits and composite features according to age, class, sex, race, species, and so on. In a word, it enables us to classify and group the heterogeneous series of activities and individuals in such a way as to obtain a general conception of the character and extent of the kingdom of minds.

The present status of this group of problems is an illustration of the immaturity of the science of psychology and of the provisional nature of its working-conceptions. Though its phenomena have been under elaboration longer than any other field, unanimity of opinion has not yet been reached as to what are to be called elements, or whether the term shall apply to the final products of introspective analysis—to elements which are psychologically real—or to the products of an ultimate theoretical resolution of the content of experience—to units which are purely abstract in the sense that they result from a break-up of the molecules of experience, so to speak, into their qualitative atoms.

So, too, in regard to the actual materials which introspection reveals in its qualitative analysis, there are disagreements as to what is fundamental and what derivative, what is simple and what composite. There is, in consequence, a variety of opinion as to the number of elements revealed by an analysis of experience. This uncertainty affects the conceptions which prevail as to laws of relationship, forms of organization, and types of reaction, as well as to the elementary constitution of the mind. It is illustrated in the controversy concerning the relation of image to thought-process, the status of sensation in phenomena of volition, the fundamental form of the law of association, and many other matters. Such uncertainties, however, are characteristic of growth and a living criticism, reflecting that active conflict of conceptions which is the method of advance in all empirical knowledge, and merely shifting to new points as the material basis of mental science is enlarged.

But the existence of these discussions serves to emphasize the fact that the growth of knowledge is not a simple addition to a body which remains otherwise unmodified. New knowledge acts as a ferment upon the old. Each increment effects a modification in the relations and significance of what is known, and its reverberation throughout the system may result in a revolutionary change in the conceptions under which it is viewed. For that synthesis of particular observations which gives rise to a general conception of mind, is not postponed until a complete exploration of the field has been made. It is under elaboration from the beginning of inquiry, and receives endless modifications through the extension of positive knowledge. Scientific advance is always complicated, involving reconstruction as well as supplementation at every step.

In all this analysis of complexes and organization of elements, the psychologist conceives his materials as a closed system, so to speak, in their internal relations purely as modifications of consciousness. But this leaves his task essentially incomplete. It describes the state, the act, or the mind, while its specific constitution remains unexplained. It is an elaborate account of the content of individual consciousness itself, which disregards its general stimulus or condition in objective change and its systematic expression through the motor mechanisms. Its analysis of any mental complex or type leaves it without environmental setting and historical background. The centering of attention upon the quality and internal relations of consciousness leads to a neglect of its external conditions and antecedents.

Now it is just in this system of objective relations that the intelligibility of any phenomenon lies. To understand anything is to apprehend its connection with other things, to determine the specific forces which act upon it and the characteristic way in which it responds to them. It is to work out those dynamic equilibria which exist between the object and its environment, and to give an account of its origin and history in terms of these empirical factors and conditions themselves. This conception finds its application equally in the treatment of organic and inorganic phenomena, and underlies the methods of psychology as generally as those of physics.

This community does not affect the distinction of one special science from another. It remains as useful as before to distinguish the vibration of a struck wire from the contraction of a stimulated muscle, for example, or the response made to a signal from osmotic reaction to a saline concentration. Whatever the qualitative nature of any phenomenon, it is to be treated in terms of the modifications which occur within it as the result of introducing a systematic series of changes into the media or forces by which it is surrounded. By this means, one determines to what influences it responds, and in what ways, and to what degrees. Response to stimulation is the single general means which science possesses of approaching the problem of explaining the nature of the things with which it deals.

In psychology, this procedure implies a methodical dependence upon the use of variations in physical stimulation, for the stimulus-change must act upon a naïve mind if its introduction is to have any specific meaning or measurable effect. It must therefore be formulated by an experimenter who is not himself the subject; and the only way in which it can be presented is in the form of a physical modification—such as the stimulus-word—which affects sight or hearing or some other sense-receptor of the observer.

The attainment of this objectivity is a desideratum of all experimental procedure; and the absence of that innocency of mind which it secures may be called the vitiating defect of introspective psychology at large. Psychological conclusions become dependable and comparable only in so far as the situation remains uncomplicated by a conscious introspection, and reaction is substituted for commentary.

It is the insistence upon this objectivity of control which points the behavioristic protest against introspective psychology, which has been pushed even to an assertion of the irrelevancy of consciousness itself to the general field-work of psychology. The immediate quality of any mental state is incommunicable, says the behaviorist, and its introspective dissection represents the essentially individual aspect of experience. The results it achieves as well as the terms it employs offer intrinsic obstacles to standardization. In spite of analytic subtlety, its product is an inert mass of subjective characterizations which must be put aside when problems are attacked under experimental conditions.

Traditional introspection has no effective answer to make to this objection. Its field is triply limited—to the observer who is at once human and adult and sane. It presupposes on the part of its subject a reflective interest in psychological problems and a sustained capacity for critical analysis. The mentally disturbed, the immature, the subhuman are all excluded. If inquiry is to be extended into these fields at all, it must make use of objective methods, by the application of controlled stimuli and the record of reactions made to them.

But even within its own field, it is urged, introspective psychology, as a general method, suffers from a radical insufficiency. It has failed to grasp the essential aspect of its problems with its endless definitions and analyses, its characterizations and classifications of phenomena. To know the human mind, or any mind, is to be familiar—in any given circumstances—with its system of characteristic reactions; and knowledge of it is commensurate with the range of stimuli to which its responses have been determined.

This method of attack experimental psychology has supplied, and its development has been a continuous historical evolution. There was no cataclysmic break between the older introspective psychology and the newer methods of experimentation. Such a solution of continuity can scarcely be said to have marked even the replacement, at an earlier date, of rational by empirical psychology when the observational method was first applied systematically. Though we are prone to contrast the two points of view and to say that the former represents a metaphysical interest, it must always have felt the need of making its conceptions measurably conform to the known constitution of the mind. The observation of fact was thus to some degree forced upon it, and the rise of empirical psychology simply marks its final attainment of an independent status.

At a later date, when introspective analysis had already been extensively employed, the limits of its utility in turn began to be felt, and experimental modes of attack were developed and applied to the problems of psychology. Its methods were thus brought into line with those of natural science at large; and its conclusions became specific and comparable, in the sense that they were capable of being expressed as the distribution of reactions obtained under determinate conditions.

This, of course, does not shift the centre of psychological interest, from the mind to material change, for example. Its original locus, whatever that may have been, is left untouched. Psychology is not thereby dissolved into the substance—let us say—of biology, just as biology is not, through the employment of graduated physical stimuli and chemical solutions in its research, amalgamated with these latter sciences.

It may, therefore, be granted that all those results which introspective analysis has yielded concerning the elementary content of the mind and the make-up of its complexes, will continue to be an integral part not merely of the history of psychology but of the study of mind. Nevertheless, in order to achieve even its own immediate aim, and especially in its wider responsibility of integrating psychology with the general system of natural sciences, this introspective characterization must be supplemented by—it might almost be said, must give place to—the experimental determination of response to objective stimuli. What we know about any mind or mental type is summed up in our acquaintance with the stimulus-field to which it responds and the reaction-patterns which these responses present. The specificity and extent of this established correlation is the measure of our scientific knowledge not merely of a mind but of any object.

The question is thus one of procedure as distinguished from aim. It has to do with the methods by which problems are to be attacked, not with the nature of the subject-matter studied. The behaviorist does not substitute the idea of motion for that of action or merge psychology in physics. What he does is to generalize its methods, and thus provide a common means of studying all activities and all types.

It should be obvious that this method is not the peculiar possession of the behaviorist. It is not a new invention, scarcely a new departure. From the beginning, it has been the essence of experimentation at large to determine character by the specific reaction which is made to a controlled stimulus. And experimentation itself, in psychology, had its beginnings in that introspective method which is now condemned as antiquated. For in its study of mental process, as distinguished from the analysis of qualitative content, observational psychology proceeded by observing the mind's reaction to stimuli. A sensory impression, for example, occurs, and a perception follows. The analysis of the latter, in the old-fashioned way, is just a tracing of the mind's reaction to this stimulus, in which the influence of former reactions, or habit, is recognized equally with that of the present impression. So of memory and association and judgment, of instinct and emotion, of impulse and volition. In this procedure, the technique of later experimentation is still undeveloped, and only the general nature of the process can be described. But there is between them an essential community of aim; and, in the end, they have the same feeling as to the way in which that aim is to be achieved.

It is what the individual mind does in specific circumstances that the psychologist seeks to know; and, from the beginning, he has sought for every form of simplification or standardization in the stimulus that might be of help in this task, and has welcomed every refinement in the means of expression whether it concerned material-recording instruments or the elaboration of a technical terminology. For we cannot oppose these two groups as representatives of rival techniques, as if such adaptive responses as tropisms and instinctive adjustments were more characteristic reactions than significant speech. No psychologist thinks of limiting himself to these inarticulate responses when he can avail himself of language either in presenting the stimulus or in making up the record. Comparative psychology itself, which depends upon them only of necessity, is thereby restricted in its work; for only through the use of language can the observer have access to the reaction in its real complexity.

As pointed out in an earlier chapter, the mind has no independent existence which can be interposed between the stimulus-field and the reaction-system. It may be described as the flooding of these areas with values and direction. The introspective consciousness of the moment and the reaction which the by-stander sees, each taken by itself, are alike inadequate records of the response. The psychologist draws upon both, and they can be opposed only through a misconception of their status. If, in one case, I ask concerning a man: What did he say? and in another: What did he mean? I am dealing with the same field of ideas in the two inquiries. There is no solution of continuity between these expressions. The latter is essentially an amplification of the former. In the understanding of my words and reflection upon the answer, the reaction to my question is as truly to be seen—both in the psychological and the non-psychological sense—as in the ultimate movement which results, in speech or action.

If, when a stimulus-word is presented, I write nothing down because paper and ink are lacking, or if I fail to speak because of motor aphasia, it is absurd to say that there has been no response if I have actually thought of what would have been spoken or written had the appropriate mechanisms been intact. In all cases of so-called delayed action, there is also an immediate response in the plan that is formed or considered, in the conflict of ideas and tendencies, in the sense that a solution cannot be reached or that the plan cannot yet be put into action. To exclude this group of factors would be like denying that anything but the end link of a chain exists because the object it suspends is hooked to that link alone. On the other hand, to say that a continuous series of reactions does unite the original stimulus with the final overt act, but that its locus is the central nervous system to which a "set" has been given, or in which a succession of disturbances has arisen, is to substitute for the describable content of intuition a hypothetical scheme of the changes occurring in a correlated system.

This factor, the complication-field of individual reaction, varies in significance almost from zero to infinity. In the simplest forms of life, it may be non-existent or negligible. All action may take the form of immediate responses having a simple, if not invariable, character. A little farther up the scale of life, the beginning of modifications in both these aspects may be observed, yet present no disabling obstacles to the application of a purely objective method. But, with every advance in the scale, this inner complication increases. The specific predispositions which an organism presents, become more numerous and interdependent. The conditions which determine effectiveness in the stimulus, increase in subtlety and remoteness. Habits multiply, introducing new complications into the reaction-pattern. The ultimate response is more and more delayed, while its significance in relation to the original stimulus is correspondingly disguised.

As a means of dealing with this ascending series of complications, the purely objective, or reaction, method is marked by progressive inadequacy until—in the case of man, at least—it manifestly breaks down. The constitution of the reactor presents a complication-system of so high an order that to define the situation in terms of the physical stimulus has become an absurdity. To predict its effect, we must take into account the complex of hereditary dispositions with which the individual started, the system of habit-modes which has been formed in the course of life, and the constellation of tendencies prevailing at the moment. Any impression whatever may thus receive an idiosyncratic modification which transforms beyond recognition its stimulative significance.

To deal with such a situation, we need all the help which the reactor's interpretative commentary can furnish. It is this commentary alone which enables us, in innumerable cases, to exclude reactions which have no place in the series within which they appear, though made in response to the type-stimulus. It enables us to detect sources of disturbance which could be located in no other way, to select and adapt our stimuli, to sift and group the reactions made to them, and to give a relatively continuous interpretation to the fragmentary records which the resultant movement presents.

While, therefore, the introspective account by itself is essentially inadequate—since the reactor is conscious only in part of the factors which interest the psychologist—what we call the mental reaction is an indispensable part of the datum upon which he depends.

The range of problems with which the development of an objective procedure has been especially connected, has been of great importance, it has been pointed out, for the alignment of psychological method with that of the other natural sciences, as well as for its own internal progress. Its importance has another aspect no less vital. All practical adaptation, in ordinary intercourse as well as in business, depends upon a knowledge of the effects of general conditions and of specific stimuli upon the reactions of individuals. Even the systematic variations which occur in those media in which man exists, such as barometric pressure, humidity, temperature, electric potential, wind-velocity, and so on, enter as active determinants into the total reaction which the individual makes. This is especially the case where men are to be treated in masses and the general influence of such variations can be made the basis of action. But these conditions also affect each member of such a group specifically, and a knowledge of their effects becomes important wherever personal relations between individuals are involved. The more nearly the personal equation can be reduced to an exact formulation, the more adequate the adjustment which is made possible.

It is, however, in the endlessly varied system of specific stimuli to which the individual is called upon to respond in his daily life, that the study of these objective conditions of action finds its chief application. Sensory discrimination with its specific defects forms the natural starting-point of this inquiry, followed by perception in all its forms including kinaesthesis, then recognition, choice, association, memory, and the specific activities of thought. The ability to retain impressions and ideas, to reproduce and apply them to present problems, to dissect and recombine the elements of any system—such as a thing, a scheme, a problem—or to organize them in new forms to meet a given end, must be determined by concrete tests. The quickness and precision of simple motor reactions, and their combination into complex activities with sureness and facility, must be graded in a similar way, as well as their continuous adaptation to external changes. It is capacities like these upon which individual success and failure turn from moment to moment. Concerning the individual's equipment in these regards, every man who deals with him must have knowledge if he is to determine what and how much may be expected from him practically in any situation, or to what place he belongs in any classification which grades the qualities or capacities of men. The field of such determination and the variety of tests and rankings to which it leads are of course practically limitless, including the whole constitution of the reactor as well as the entire range of conditions under which reaction occurs.

This group of problems constitutes the field of applied psychology as such; for all inquiry concerning individual variations in the mental processes involved, or concerning the genesis and racial affiliations of any mind or mental group, is undertaken by applied psychology solely as a means of supplementing the inadequacy of conclusions which depend upon the objective record of present reactions alone. An intimate knowledge of the particular way in which a given result was achieved in any class of reactions, may enable one to estimate more intelligently the dependability of the reaction or the kind of response to be expected under more complicated conditions. The genetic history of a reactor, likewise. will throw light upon his future development, the duration of progress to be looked for, the grade of expertness to be attained, the period during which successful adjustment is likely to be maintained, the probable onset of reaction or senescence, and the like.

To make a concrete review of this series of problems would involve, in the first place, a survey in detail of the whole field of sensitivity to stimulation which the individual presents, whether general or specific, simple or complex, sensory or ideal, immediate or remote. This determines the qualitative limits of his capacities and to some degree indicates the range of development to be expected. In addition to the positive limits of sensibility, the difference-thresholds for both qualities and intensities must be worked out as the basis for a quantitative expression of the individual's position in the series of variants with relation to which he is to be classed and treated. As individual aptitudes are not all manifested from the outset of life, and as the rate of development presents accelerations and retardations, the determination of these potentials is not to be accomplished by a single set of tests but implies the gradual development of a systematic life-record which becomes more determinate as it advances.

From an exploration of elementary sensibility, the elaboration of this individual record proceeds to a study of perception as mediated by each sense and manifested in the apprehension of objective realities in all their relations. It begins with the perception of individual things including their identification and classification—in relation to utility, for example—but it extends also to the grasping of innumerable groupings and schemes of things, familiarity with complex fields of sensation, and reaction to them as totalities. It includes perception of the size, form, number, and arrangement of objects, the sense of direction, position, movement, interval, and distance. It must be extended to the judgment of time- as well as of space-relations, with their magnitudes, trends, and margins. In its more complex development, it also embraces a study of the coördination which the individual has achieved between these intricate series of relationships as shown in his motor control, response to signals, and adjustment to external change at large.

The characteristics of the individual's motor reaction to stimuli must be developed in a similar way. Muscular power, endurance, and control must be tested under manifold conditions. The force and precision of individual contractions, as well as the speed, uniformity, and coördination which mark a series of reactions must be determined. Simple and complex successions of movements must then be studied in connection with each of the more important muscle-groups and more significant forms of activity.

This affords a measure of the individual's capacity to perform with sureness and facility the movements involved in the various forms of expertness underlying technical proficiency and of his general ability to make continuous bodily adjustment to external changes. And finally, to complete this part of the record, specific tests must be made under actual working-conditions of the individual's performance in the industrial and artistic, technical and professional activities themselves. This last, however, is a test not of motor control and manual skill alone but of the complex coördination of all the individual's powers in the achievement of a systematic aim.

The study of individual constitution includes also a determination of retentiveness for impressions of all kinds—the persistence, range, and precision of his memories—distinctive predispositions as shown in his spontaneous attention, likes and dislikes, natural interests, etc., and the quality and distribution of affective tone in his experience.

Still more important, perhaps, as having more value for our general classifications on an intellectual scale, is the individual's characteristic reaction in each field of sensitivity and the distinctive combinations which the materials of experience habitually receive at his hands. This group of problems makes its first appearance in the nature of elementary association itself, in the range of ideal connections which any stimulus establishes or reärouses in the mind under specified conditions, or at any particular age, or in its totality as a product of experience. The range of these habitual associations gives a certain measure of the amount of actively living material which the mind possesses, as contrasted with the latent or potential content which under conceivable stimulation might be functionally aroused.

With this question of the nature and range of active association goes that of the facility and promptness with which such connections are reëstablished, as determined by the reaction-time involved. Slowness in perceiving, understanding, or remembering, impedes ideal combination, and reduces the grade of organization in the product. But the specific problem here is a determination of the mind's constructive capacity in relation to all those necessities for adjustment and control which it encounters. Its grasp of materials, its analysis of problems, its ability to reorganize and to apply, its comprehension of complex schemes of relationship—such qualities of mind as these are the general ground of high achievement in any field, and the task of psychology in this group of problems is to determine the individual's status in relation to the manifold forms which these activities take.

The general result of all this is a knowledge of the mind in a new way, namely, in its relation to the whole system of measurable stimuli which the objective world affords. The mind is thus described not in terms of its immediate qualitative existence, or its own inner articulation, but in terms of its reactions and products. What is studied is not the consistency of its processes as expressed in laws, but its place in relation to the world in which it exists, with its measure and value, its record and grade in relation to other minds. It becomes known by developing its qualities under definite reagents, by ascertaining the combinations into which it enters and the products to which it gives rise when acted upon in specific ways.

The mind thus receives a place, like anything which possesses a specific complex of properties, in the general system of the intelligible world. We know how the individual mind, or the typical mind of any group, is affected by the general conditions of existence in the organism, by nutritive levels, work, excitement, fatigue, age, disease, and so on, or by variations in the media surrounding the body, by heat and cold, moisture, wind-pressure, barometrical readings, electrical conductivity, and the like. We know its sensorial normality or deficiency—in sight, hearing, touch, kinaesthesis—the range of stimulation in each field, and the keenness of its discriminations within these limits.

Similarly we learn the quality and tenacity of its memories, the range and availability of their materials, the rate and stability of its associative processes in general or in specific directions. We discover the original preferences and trends of the mind, determining what stimuli secure and retain attention, what forms of activity are chosen, what habits are easily acquired and in what fields learning goes on under stress and difficulty, what things please and to what the individual is indifferent. In a word, his natural aptitudes and capacity for development, in all the important stimulus-fields and forms of reaction, are revealed by these systematic tests; and similarly, in regard to all other specific aspects of the mental constitution.

By these means, further, we are able to trace the changes in sensitivity or reaction or grade of organization which mark the life-history of the individual, making it possible to reclassify him as occasion requires and even to construct the general genetic curve which his history presents. This not only throws light upon practical problems which involve the conception of developmental norms, but even enables us to hazard a prediction as to the future course of this curve—its crest, altitude, and period.

The last general group of problems in psychology, as in all science, is historical. To know the present constitution of the mind and its characteristic responses under stimulation leaves the treatment of mental problems incomplete. The present is a cross-section of what is an historically continuous and incessantly changing system. Its specific constitution cannot be conceived apart from the effect of forces which have acted upon it in the past and the modifications which they have brought about in its nature. These influences, as really as its original constitution, have made it what it is; for its present state is but the last stage in this continuous process of change, integrative or disintegrative, which constitutes its history. This is true of everything which exists; but it is of especial consideration in the case of the individual mind, since its whole specific content is of acquired origin, and the development of every activity has taken place in intimate dependence upon environmental stimulation.

Any specific reaction may thus be explained in three ways: by reference to the existing constitution of the mind, or by reference to the stimulus under which it acted, or by reference to the past which moulded its character. In our practical dealings, it is with the present constitution of the mind that we are concerned; understanding its history will not change its nature. And it is by the control of the environment—that is, of the stimuli which act upon the mind—that all modification of it is to be secured; its past cannot be reached or touched. But the actual constitution which the mind possesses, and therefore the effect which stimuli will have upon it, cannot be fully understood without a knowledge of its history. Two developing minds, like two moving bodies, may at a given moment be abreast of each other; but one may be moving at a slower rate than the other, or have reached its maximum or passed it, while the other is still gaining momentum.

The primary significance of historical study lies in the light which it thus throws upon the present constitution of things. In its make-up and habitual responses, a mind may conform to the general type of the group to which it belongs, yet display, under specific stimulation, a unique reaction due to the idiosyncratic features of its history as an individual. The particular constellations which appear in our mental associations, like the polarizations which use may cause in a piece of metal, or the peculiarities of growth which result from a tree's exposure, are to be explained only in terms of the specific historical conditions under which it has existed. From this point of view, the individual mind as a whole is a plastic system of ideas and reaction-patterns which has been formed in response to the unique totality of forces acting upon it in the past.

Genetic psychology, of course, possesses other values than its significance in the practical diagnosis of present mental constitution. It is necessary for the work of the systematist at large. The distinctive mental characteristics of a group of genetically related individuals are to be explained in part by reference to the common heredity they possess, or, as regards their differences, by reference to unique elements or groupings among these hereditary components. But they are also to be explained in part by reference to communities or diversities of experience, to life under common conditions and stimuli or the influence of differentiating environments. Both as a theory of determinants and as a measure of their effects, the historical segregation of organic groups and their exposure to unlike forces has become a conception of central importance.

The study of heredity as well as of environment thus falls within the scope of genetics, providing the general background against which the features of ontogenesis are projected. The congenital organization of the mind, as well as its present constitution, is viewed historically, and its hereditary complexes are conceived as the products—more stable than the acquired reaction-systems but yet essentially plastic—of secular forces which have moulded and fixed their forms.

It may thus be said that there are three phases to the historical study of mind, or three successive perspectives of continuously widening scope under which the development of mind is to be viewed. These may be indicated by the terms: Ontogenesis, Racial Heredity, and Organic Evolution. The life-development of the individual affords the immediate background for the idea-systems and reaction-habits which his mind presents. The contents of these systems reflect the general quality of the stimulation to which he has been exposed, while their specific form represents the reaction of his own unique constitution to the totality of conditions under which development has occurred. But, as these mental patterns show congenital features which vary from individual to individual, while at the same time they present distinctive resemblances within family groups and ancestral series, a study of their hereditary aspect is immediately provoked.

The locus of the problem is thus shifted and the time-scale altered, but nothing else is changed. Traits which form the groundwork of experience in the individual, are now conceived as the product of a longer and slower interaction between the organism and its environment or of selective and blending processes which, accumulating generation by generation, have finally given rise to the specific complexes of individual inheritance. By a further, but essentially similar, extension of this historical postulate, the most general traits of mind are brought into comparison with the whole range of animal life in order that their origin and genetic relations may be established as part of a comprehensive scheme of mental evolution.

The historical and genetic study of mind introduces a new aspect to the problems with which psychology had previously dealt, in addition to extending their bounds by the inclusion of masses of additional materials. In the analyses of introspective psychology, the mind is conceived as a static system which can be dealt with only to the extent of describing its specific characteristics and expressing their relations in a series of laws. In its determination of reactions to stimuli, experimental psychology itself regards the response merely as an indication of specific constitution, which may be made the basis of a more dependable theoretical classification or a more useful practical rating of the individual than introspection affords, but which does not essentially alter its conception of mind.

Even in this field, genetic study provides a methodological extension which greatly enlarges the material basis upon which all classification and rating of individuals is grounded. It thus makes it possible to correct as well as to supplement the work of introspective and experimental psychology. But it also creates an additional range of problems, and brings into existence a new interest in the whole mass of observations and conclusions to which these earlier methods of study have led.

The mind which genetic psychology explores is an historically continuous existence, rooted in the past and embracing the future, undergoing endless dissolution and reconstruction, changing even within the period necessary to determine and record its present features, yet presenting, underneath its revolutionary alterations, characteristics as specific and coherent as those which are exhibited by the mental constitution of the moment. Of that historically real mind, the present constitution is but a cross-section, the making of which is attended by theoretical as well as practical dangers. Any such cross-section is an abstraction representing in terms of a fixed system of characteristics what is but a single moment in a moving and changing system. This living reconstruction must be arrested in order that the cross-section shall exist; a static fiction replaces its dynamic equilibria.

Not only, then, is any such description of the mind, as it exists in a particular constellation of activities or at a specific moment in time, a wholly inadequate measure of its real constitution, but it is likely to establish, in the thought of one who habitually depends upon it, a fundamental misrepresentation of its real nature. This consists in the rise of a working-conception in terms of such a logically fixed system of characteristics instead of the development of a habit of treating the mind in terms of a plastic and mobile existence in time. The anatomist may treat his nerve-sections as independently real, since it is the notion of coexistence in the series of points they compose which constitutes the spatial reality of the nerve. But, as the mind exists only in a succession of moments, the psychologist, in order to represent its nature adequately, must retain his sense of the fluid motion of its course; for, in this conception, his final system of references are to be sought in matters of theoretical treatment and practical direction alike.

The field of genetic psychology thus becomes the centre of interest in a scientific study of mind as well as in philosophical and practical thought. Here the most complex and significant problems lie. Here an explanation is to be sought for that whole system of features which the individual mind presents. The historical view-point adds a new dimension, not merely a new province, to mental existence. It not only explains a multitude of individual variations which experimental study had established while it could not account for them, but it also throws into new light and relations the whole range of problems which the psychologist has under consideration. Hitherto he saw only the surface of a solid whose internal structure determined its contours. It is this underlying system of historical conditions, this path antecedently traversed, which genetic psychology reveals. Because the phenomena which the individual mind at any moment presents are intimately and continuously dependent upon these antecedents and temporal conditions, genetic study may be said to afford the ultimate ground of their intelligibility as well as the essential basis for their direction and control.

In its study of the individual mind as an existence in time, the two general problems of psychology may be indicated by a distinction in the use of the terms "historical" and "genetic." For the traditional notion of the adult mind as a fixed type, the historical viewpoint substitutes the conception of an existence which, because it undergoes continuous change, requires for its description a comprehensive series of cross-sections embracing the individual life-cycle in its totality and providing a sufficient number of points for the determination of the graphic contours included within its limits. The number of such structural sections is a question merely of the degree of continuity desired in the curve, the smoothness of its gradations in representing the incessant changes of status or direction which the history of the individual mind presents.

Taken by itself, any component of this historical series is but an introspective or experimental determination of the system of characteristics which mark a particular point in its development. A succession of instantaneous photographs of the changing mind is substituted for the single image received when attention is limited to the normal adult. The generalized conception of the human mind is thus replaced by a discrete series representing infancy, childhood, youth, and so on. But this—were the work to end here—merely extends the range of species to be characterized without affecting the point of view or the nature of the problems involved. The result is still purely a psychology of types. The mind of the infant differs more from that of the child, and the child mind from the adolescent, than any normal infant or child mind differs from another of its own class. Nevertheless these psychological summaries of their distinctive features, like the description of racial or organic types, have the value only of field-manuals for the identification and rating of individuals.

But the very conception from which historical study at large springs, is that of an essential continuity which pervades all these successive types and binds them in a vital or dynamic unity. The contours afforded by connecting the corresponding points in this chronological series of sections are no theoretical curves representing merely logical postulates but the actual outlines of the mind's true dimensions. The psychological individual is just this changing existence in time, for whose determination all these cross-sections are necessary but of which they can give in the end only an abstract schematism. Even though an historical study of each component activity of the mind be substituted for a characterization of its features as a whole, the result is not affected.

The outcome of all this study, however far it be carried, is a mass of data—but no more—for the statement of the second and specifically genetic group of problems. As a preliminary, these inquiries are, therefore, to be carried to their limits. Chronological sections must be repeated at continuously approaching points, in order that the curve of development may be known with the nearest approach to actual continuity. The structure of the mind must be broken up into an increasing number of constituents, each of which is subjected to this historical scrutiny, in order that our representation shall pass from the form of a silhouette to that of a modelling in relief which reproduces the solid contours of the mind. And this study must be pushed not only to the limits of ontogenesis but to the bounds of life itself, that the most remote beginnings and the most primitive forms of mental activity shall be made available.

But, to give to all the facts thus revealed their final unity and to make them an intelligible system, they must be studied not merely in their historical succession but in their dynamic relations as phases of a single evolutionary process. The sequence of types or of characteristics which the life of the individual mind presents, constitutes but the material datum of genetics, which seeks always the principle according to which its changes occur. It passes immediately from an observation of the special features which mark successive stages in development to a study of the conditions under which they arise and the relation of environmental forces to the constitution of the subject upon whom they act. It follows the sweep of systematic modifications in which individual mental history consists, in order to discern the dynamic interactions which underlie every change in superficial feature. For any stage in the mental life or any phase in the development of a particular activity does not merely replace that which preceded it but grows up out of it and is determined by it. Reaction and attitude reflect always an internal momentum as well as an objective stimulus. What one thinks or does is—though it is not only—a function of what one has thought and done. The course one follows is—even if modified—the continuation of a course already laid down.

Since all successive moments of experience are thus vitally linked, it becomes impossible to understand the present mental constitution, or any feature of it, in isolation from its own past; and our comprehension increases just in proportion to the extent of the historical perspective in which it is viewed. This personal history in its specific totality must be given, if any mind or mental act is to be completely intelligible.

The field of genetic psychology in the narrowest sense is this internal system of organic relationships which pervades the mind's historical existence and gives to it a vital continuity throughout its extent. It is a study as inexhaustible as it is fascinating, which finds its application in every progressive modification of the mind. The act of learning, the formation of a habit, the acquisition of skill, exhibit its phenomena as essentially as the moulding of individual character in its wholeness. Since its materials are thus afforded wherever historical change occurs, genetic psychology finds its logical starting-point not in an attack upon the bewilderingly complex structure of the mind as a whole but in an analysis of the simplest and most specific processes of adaptation in progress at the moment. For the totality of changes which characterizes the transition from any one stage of development to that which follows, is to be regarded as the composite expression of a multitude of minute individual modifications each of which, in its own way, embodies the same fundamental genetic laws.

The scope of this conception is clearly universal. Everything that is empirically conditioned may be viewed historically and explained in terms of its genesis. The casual adaptation which arises in the course of an hour, to lapse without a revival, and the most fixed and ancient habits of the mind, are alike subject to its solvents. Thus a luminous network of relations gradually penetrates and defines the mind, giving meaning to every detail of its constitution, to every form or historical status it presents, and providing the fundamental basis of direction and control as well as the final element in its intelligibility.

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